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ATTITUDES OF THE PEOPLE OF FRANCE TOWARDS THE SUPERSONIC BANG

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16. Abstract
This report describes the survey conducted to study the attitudes and opinions of the people of France towards the supersonic boom. The information collected provided answers to the following questions:
-How does the boom rank among today's pollutants?
-Is perception of the boom objective?
-Does the frequency of exposure to the boom influence attitudes?
-Does sensitivity to the boom or annoyance from the boom increase linearly with the frequency?

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ATTITUDES OF THE PEOPLE OF FRANCE TOWARDS THE SUPERSONIC BANG

INTRODUCTION

For almost ten years people's reactions towards supersonic booms have been the subject of systematic studies in Great Britain and France, and particularly in the United States. /1*

The results, however, are highly dependent on the conditions in which the tests are performed and cannot be effectively applied to other population samples. This is especially true of French inhabitants who have been exposed daily to military aircraft booms, and more recently, to civilian aircraft booms.

For this reason, in 1970, the Secretariat General a l'Aviation Civile (SGAC) - General Secretariat for Civilian Aviation - commissioned the Direction des Recherches et Moyens d'Essais (DRME) - Research and Test Equipment Headquarters - to coordinate a series of investigations on the effects of the supersonic boom. Among these, the study of attitudes and opinions of French inhabitants exposed to booms was assigned to the Centre d'Etudes et de Recherches Psychologiques "Air" (CERAPIR) - Air Psychology Research and Studies Center -. As early as 1965, this organization** had completed a first survey in the most exposed regions of France at that time: the South-West and the North-East. A second study, however, became necessary because of changes in study conditions.

Military authorities took measures to decrease the intensity of booms on the ground: absolute prohibition of overhead flights in certain regions, higher minimum flight altitude, radar control of flight traffic.

A new geographic area is now exposed to Concorde booms during its test flights. The construction of this aircraft and its test flights over France have led to a wide information campaign. Several suits for damages have already been filed. /2

The new operation of French and foreign supersonic aircraft will subject other regions in France to civilian aircraft booms regardless of whether they had already been exposed to military aircraft.

Whereas this was not the case in 1965, it is now possible to determine the intensity of booms produced on various points of the national territory and the mean frequency of supersonic flights for the different regions under consideration.

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*Numbers in the margin indicate pagination in the foreign text.

**Called at the time le Centre d'Etudes et d'Instruction Psychologiques de l'Armee de l'Air - Psychology Teaching and Research Center of the Air Force -.

With this information we are able to make a comparison with the results obtained in 1965, and answer the following questions:

-How does the boom rank among the pollutions of modern life?

-What type of annoyance does the boom cause? Is it affected by sociological or psychological variables? What is its impact?

-Is perception of the boom objective? Is the number of booms heard over or underestimated?

-Does the frequency of exposure to the boom influence attitudes?

-Does the sensitivity to the boom or annoyance from the boom increase linearly with the frequency?

CHAPTER I - DESCRIPTION OF THE PROBLEM /3

1 - PREVIOUS RESULTS

The main results obtained until now regarding public reactions to supersonic booms are summarized in "Human and animal response to the sonic boom" by C.C. Rice and G.M. Lilley and are mainly based on research conducted in the United States, Great Britain and in France.

Except for the investigation conducted by the Centre d'Etudes et d'Instruction Psychologiques de l'armee de l'air (CEIPAA) in 1965, all research conducted in Anglo-Saxon countries is characterized by "laboratory experiments" which place the subjects in a more or less artificial situation, outside the conditions of their daily life. Moreover, only the experiment in Oklahoma City (1964) used a sufficiently large population sample.

Considering these limitations, the main results found may be summarized as follows:

-annoyance may be evaluated from objective complaints and the number of suits filed for damages [1,6,8];

-the two most significant sources of annoyance for daily activities within the home are vibrations or shaking of the dwelling or jolts [1,8];

-the annoyance felt is closely related to the fear of damage to personal belongings thus bringing about unfavorable attitudes towards booms and supersonic aircraft [1,8]; /4

-annoyance slightly increases with the intensity of booms and the duration of exposure to booms when their intensity is constant. Intensity has more impact than the frequency of exposure [1,8,10];

-annoyance and damage caused decrease as the individual or property exposed are farther from the path of the aircraft over the ground [1, 8];

-people feel less annoyed to the extent that they are more convinced that booms are superficial and limited to certain regions [1,10]. This feeling is stronger as the home environment is noisier [8];

-people become used to the boom when there is a regular exposure to daily work conditions [6, 10]. Subjects questioned, however, say they definitely cannot become used to ten booms per day [1,2,8,10];

-sensitivity to the boom is strongly influenced by sociological factors, whereas geographical and home factors do not seem to be determinants [2].

2 - THE SITUATION IN FRANCE

2.1. Frequency and Intensity of the Booms

For close to two decades French inhabitants, apart from the Paris region, have been subjected to booms from supersonic military aircraft. These flights, however, do not affect all French people in the same way.

Supersonic flights (appendix I), relatively less numerous above certain departments of the North-East and South-West, are less frequent in the South-East and are occasionally rare in the North-West. Furthermore, for a given department, the inhabitants are not subjected to the same exposure, depending on whether or not they are under the aircraft path. /5

Intensity of the booms depending essentially on the type of aircraft, atmospheric conditions and terrain, is highly variable and practically impossible to control. Accordingly, only one variable could be taken into consideration: the frequency of exposure to supersonic flights, by assuming that a given flight influences all inhabitants of the same department with the same intensity.

However, it has been generally admitted that until now the mean intensity of booms produced by French military aircraft is about 1 millibar. The first measurements performed with the CANIBAL* Transducer showed lower values of 0.6 millibar (median) with variations of 0.4 to 1.6 millibar. This intensity range seems to noticeably intersect the peak overpressure range observed during test flights performed by the Concorde at Mach 2 at an altitude of 15,000 meters.

2.2. - Regulation and Control of Supersonic Flights

Since 1956, regulation has been subject to successive modifications, particularly concerning the flight altitude. The essential points of this regulation are now the following (I. 48383 of November 26 1965).

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*CANIBAL = Capteur Automatique de Niveau de Bang Local (Automatic Bang Transducer). These measurements were performed in July.

Supersonic flights are authorized above the national territory, except over the Paris region, provided that accentuated vertical dives are not performed and that the flight altitude is equal to or greater than 10,000 meters. They are also authorized above the sea beyond 30 km from the coast without restriction.

This general regulation is nevertheless limited by: /6

-the time of day: supersonic flights are prohibited at night from 10:00 p.m. to 7:00 a.m. (local time);

-the season: they are prohibited above high mountainous regions of the Alps and the Pyrenees from November 1 to March 31; they are prohibited above the coastline from June 15 to September 15;

-accelerations must be in a straight line and banking must not exceed a maximum angle shown as a function of speed and altitude.

Until 1970, all supersonic flights were carried out by military aircraft and were subject to permanent radar control. Control is also carried out by bi-monthly recordings provided by radar recordings supplied by detection and control centers (CDC). However, these bi-monthly measurements contained some inaccuracies making it difficult to statistically correlate supersonic flight with damages. More accurate and more complete readings of radar measurements are transmitted to the regional Air Headquarters concerned and serve essentially to check into suits for damages. Until recently, they were also centralized at the Air Force Headquarters.

Since 1970, certain regions of France have been overflown by the Concorde during its test flights within a restricted number of supersonic flight hours fixed annually (40 hours in 1971). Each flight provided a very accurate record of the flight path over the ground by taking repeated measurements of the boom intensity produced along the path.

2.3 - Complaints /7

There are two types:

-complaints of annoyance constitute about one-third of the total number of complaints. This is only a rough estimate, because they are rather difficult to verify due to the scattering of the recipients (from the Prefect to the President of the Republic), they are often expressed by groups and they are repeated when the response given by the authorities is considered unsatisfactory;

-suits for damages are better known because they are centralized at the level of each air region which treats them as contentious material or transfers the data to higher echelons. Yet, the available information has never correlated statistically with other available parameters, such as equipment type, altitude, Mach number, time of the supersonic flight, etc.

3 - ORGANIZATION OF THE SURVEY

The survey was conducted from November 11 to 16, 1970. The questionnaires contained about 150 questions. To avoid biases about the boom, the apparent theme of the survey was environmental problems and ambient noise.

Conducted by IFOP, the interviews lasted 30 to 45 minutes and were generally well accepted. A total of 3,992 interviews were conducted, including 283 given to people who had sued for damages.

The survey unit selected consisted of individuals at least 20 years old living in the provinces, as supersonic flights over the Paris region were prohibited.

Information of supersonic flights provided by the air regions /8
for 1968, 1969 and the first nine months of 1970 made it possible to calculate monthly averages of exposure to supersonic flights per department and to distinguish five frequency bands of exposure (appendix I): 0 to 10, 11 to 30, 31 to 60, 61 to 90, 90 and above (in practice 90 to 140)*

The sampling of people to be interviewed was carried out by the Institut Francais d'Opinion Publique (IFOP-ETMAR) - French Public Opinion Institute - using the quotas technique. Variables of sex, age and professional status were controlled in order to obtain a sample representing the French people at the national level, for different frequencies of exposure in routes likely to be used in the future by aircraft of supersonic airlines and in regions overflown by the Concorde during test flights performed during the months prior to the survey.

3709 questionnaires were filled, 3632 of which proved to be processable. From this batch, one sample was drawn to represent 2082 questionnaires based on the characteristics above.

In order to collect valid opinions of the boom, i.e., those of people who actually hear the boom and identify it as such, three filter questions were asked at the beginning of the interview. After processing these questions, one representative sample identifying the boom composed of 1557 questionnaires was formed. Measuring instruments were designed according to this sample (attitude made of opinions representing different sociological groups, a certain number of interviews were added (1291) in order to obtain enough people to represent certain population categories.

Furthermore, based on the address of 283 protesters, a sample was formed from the list of people who filed a suit for damages during the first months of the year 1970. Complaints of annoyance alone were eliminated because they were not very numerous and they were too often expressed by groups.

CHAPTER II - PERCEPTION OF THE SONIC BOOM /9

We have just noted that three questions (Q. 12, 13, and 14) serve as filter questions so that the entire questionnaire is given only to people who hear the boom and identify it as such. The answers

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*It should be noted that in 1970 the monthly average of supersonic flights decreased, especially in the most exposed regions.

to these three questions already give interesting indications of the general impact of the boom on the people of France. Other questions then make it possible to evaluate whether the perception was objective and, finally, how the boom ranks among the different pollutions of modern life.

1 - GENERAL IMPACT OF THE BOOM

The percentage of answers to the filter questions make it possible to draw a general table of the situation.

Besides the 27% of people questioned who spontaneously mentioned the boom among noises heard, 15% also spontaneously mentioned that they heard airplane noises when they were asked.

Additionally, 35% say they hear booms when answering a direct question (A. 14).

Finally, 23% declare they never hear booms.

The French people who are theoretically concerned by booms are thus not equally affected by them. For one-fourth of the population the boom is important enough for it to be mentioned spontaneously; another fourth of the people ignore it completely. The other half of the people hear the boom, but are not affected by it enough to mention it as a noise. /10

The breakdown of answers by frequency bands of exposure to the supersonic flights shows that the general impact varies with this frequency. The increasing proportion of answers to question no. 12 which corresponds to spontaneously mentioning the boom as a noise is particularly revealing in this respect, as is shown on the following table:

TABLE 1

%	Frequency Band 1 (0 to 10)	Frequency Band 2 (11 to 30)	Frequency Band 3 (31 to 60)	Frequency Band 4 (61 to 90)	Frequency Band 5 (greater than 90)	All Bands
Q. 12 Spontaneously mention boom among environmental noises	13	27	33	54	53	27
Identify the boom (Q.12 + 13 + 14).	58	85	88	97	92	77

If the people who mention the boom spontaneously are more numerous in communities of less than 20,000 inhabitants and among farmers, on the other hand this perception does not depend on other characteristics studied, such as sex, income, age or whether individuals are owners or renters.

2 - ESTIMATE OF THE NUMBER OF BOOMS HEARD /11

Statistical readings of supersonic flights make it possible to calculate average monthly frequencies per department, while indicating the actual maximum number of bangs likely to be heard, since each of them relates to part of the department and not all of it.

Compared to this average frequency taken as criteria, answers to question 16 asking for an average estimate of the number of booms heard, bring to light a definite under-estimation of the monthly average of booms actually heard and this is accounting for the remark made above. An overevaluation was recorded only in a ratio of two per thousand.

Finally, it was observed that a highly significant relationship between the assessment and the criterion: people living in departments the least exposed departments give the lowest monthly estimates and vice-versa.

3 - RANK OF THE BOOM AMONG THE DIFFERENT POLLUTIONS OF MODERN LIFE

It was asked (A. 15) to select the three most pressing problems to be solved on a list of ten items. The ten problems are grouped in four levels of seriousness (Appendix II) as follows:

1 - Cancer

2 - Road accidents

3 - Air pollution

-Booms caused by supersonic aircraft

-Throwing out garbage and waste products in the countryside

-Sea and river pullution

4 - Noise /12

-Reduction of parks

-Invasion by publicity

-Invasion by secondary residences in the countryside and seaside.

The boom is thus ranked at the same level as air pollution, after cancer and road accidents and just before noise.

It should be pointed out that the first two levels of seriousness constitute pollutions that are capable of directly affecting health, or even survival. The class in which the boom belongs is concerned with items having indirect and long-term effects.

This same classification is found among protesters, except for "leaving garbage and waste products in natural surroundings" which transfers from the third to fourth level of seriousness. This may perhaps be explained by the special characteristics of this population sample.

CHAPTER III - DIMENSIONAL ANALYSIS OF ATTITUDES /13

The technique used until now - hierarchical analysis*- to define and evaluate most dimensions explored makes it possible:

-to construct consistent rating scales and to compare the opinions of groups characterized by different sociological variables;

-to check the consistency in the answers and thus the extent to which the questions were understood and the seriousness with which they were answered;

-to break down the population sample into favorable and unfavorable (attitude intensity curve) by accounting for nuances in answers and determining the ratio percentage in each category by specifying the degree with which opinions are expressed.

Furthermore, the fact that it was possible to find a dimension /14
and build a measuring instrument (Guttman scale) proves that the evaluated attitude is consistent enough in the population sample, i.e. that the contents defined by the items forming the scale relate satisfactorily to this population sample.

Accordingly, nine attitude dimensions were defined:

-Annoyance from booms,

-Annoyance from noise,

-Sensitivity to noise,

-Sensitization to booms,

-Acceptance of booms made by commercial supersonic aircraft,

-Acceptance of booms made by military supersonic aircraft,

-Attitude towards supersonic transport aircraft,

-General satisfaction of the environment.

The different attitudes defined will now be considered by regrouping some of them to facilitate the presentation of this report.

1 - ATTITUDES TOWARDS THE BOOM

1.1 - Annoyance from the boom

In order to compare the effects of the boom with those of noise, two identical questions with eleven items were asked during the survey. The dimensions defined by the corresponding attitude scales proved to be quite different in content (appendices III and IV).

Whereas annoyance from noise relates to numerous aspects of daily routine: work, sleep, conversation, radio or t.v. sounds (ranging from the least to the most annoyed), annoyance from the boom takes a completely different meaning: fear, irritation, startling, the only common element being work or daily activities. These are then psychological or nervous reactions rather than simply annoyance. The two effects - noise and boom - are not perceived in the same way, but are nevertheless related to the attitudes they create (correlation of .23 between annoyance from noise and annoyance from booms). /15

1.2 - Sensitivity to the Boom

To compare results of this survey with those found in 1965, a larger dimension called "sensitivity to the boom" was defined by a scale of six questions (Appendix V), three of which already belong to the scale of annoyance from the boom (out of four questions). The virtual impossibility of distinguishing annoyance from the boom and sensitivity to the boom by two quite different scales shows how intricate these aspects are and the significance of psychological factors in perception of the phenomenon.

Conversely, it was possible to build two distinct scales (although correlated at .36) of annoyance from noise and sensivity to noise even though their determining factors are completely different: annoyance from noise is expressed in behavioral terms, sensitivity to noise is expressed in psychological terms (Appendix VI).

1.3 - "Sensitization" to the Boom

Three questions proved to be statistically interrelated and formed a scale (Appendix VII) evaluating the feeling that for more than two years booms are increasing, very strong or deafening and more and more annoying (explaining the term "sensitization" selected for this question class). In actuality, the trend has been the opposite over the past two years. This attitude shows that prejudices

are increasing, but is correlated with annoyance from the boom (.38) and sensitivity to the boom (.42).

1.4 - Intensity of Adopting Definite Attitudes* /16

Investigation of the intensity of adopting definite attitudes makes it possible to construct curves to determine the percentage of people who say they are "annoyed by the boom or noise", and "sensitive to the boom or noise". The curves themselves are shown in the appendix together with scales. Only the results of analysis will be shown below:

TABLE 2

Dimensions	%	People say they are:
Annoyance from the boom	29	annoyed
Sensitivity to the boom	49	sensitive
Annoyance from the noise	10	annoyed
Sensitivity to the noise	57	sensitive

The shape of the curves shows that the positions "for" or "against" are stated with the same intensity for sensitivity to the boom and sensitivity to noise. Conversely, those who are annoyed very little or not at all by the boom express their opinion with the most intensity, whereas those who say they are annoyed, express their opinion with the least conviction.

Comparison of these results with those of the survey conducted in 1965 shows that attitudes towards the boom have become more consistent. Stronger attitudes coupled with the fact that the survey of 1965 was conducted only in the two most exposed regions of France - whereas the present survey is concerned with the whole country - confirm that people have become more aware of the boom.

2 - ACCEPTANCE OF BOOMS PRODUCED BY SUPERSONIC AIRCRAFT /17

We could assume that booms caused by military aircraft are accepted less and that booms caused by supersonic transport aircraft are accepted more in different circumstances.

To check this assumption, two identical questions were asked, one regarding transport aircraft, the other regarding military aircraft.

*We say that an attitude is intense when it corresponds to definitely favorable or unfavorable attitudes; a weak attitude corresponds to a hesitating attitude.

Q. 36 - In your opinion, should supersonic aircraft - commercial or military - be authorized to cause booms in the following areas?:

	a) Commercial Aircraft	b) Military Aircraft
	yes	yes
	%	%
-above large cities	3	2
-at low altitude	3	3
-*over the whole country	12	12
-*in the mountains during winter	22	22
-above the coastline	27	26
-*near airports	35	33
-*over population regions	51	48
-*at high altitude	74	71
-over the sea	89	85

Based on these results, two attitude scales were studied and constructed, one for commercial aviation, the other for military aviation (Appendix VIII).

Both instruments obtained are identical in content. From the lowest to highest percentages of acceptance the two scales are classed as follows: over the entire national territory, in the mountains during winter, in the vicinity of airports, in regions of low population density and at high altitude. /18

The people questioned did not make a distinction between the two types of aviation and adopted the same attitude towards both (correlation of .87). In short, 12% of the people unreservedly accepted the booms (except at low altitude and above large cities), whereas 26% of them systematically objected to them even at high altitudes (and 10% even above the sea).

3 - CREDIBILITY IN THE POSSIBILITY OF CONTROLLING THE BOOM

To analyze this dimension, the technique of hierarchical analysis could not be used: only percentages of answers were calculated. Due to the lack of statistical cross-checking, it was not possible to determine the extent to which the answers are consistent and reflect actual trends rather than momentary opinions.

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*Questions constituting both attitude scales

Two questions were asked:

Q. 31 - For each category of people I will list, would you tell me whether, in your opinion, they are capable of doing something to control the boom?

Q. 32 - And, in your opinion, do they do everything possible to control the boom?

The results obtained are shown in table No. 3 below:

TABLE 3

/19

%

	a	b	c	d	e	f	g
h	28	28	40	43	49	59	60
i	13	13	15	17	20	14	18
j	15	15	25	22	27	36	34
k	0	0	0	4	2	9	8
l	24	34	30	16	21	11	11
m	48	33	30	41	30	30	29

Key: a-Civilian airports; b-Industrialists and architects; c-Pilots; d-Airline companies; e-Aircraft manufacturers; f-Air Force; g-Civilian authorities; h-are able to act; i-and do everything they can; j-do not do everything they can; k-no opinion; l-are not able to act; m-no opinion.

It may be observed:

-a high percentage of people say they do not know if the categories listed are able to do anything about the boom (29 to 48%);

-an equally high percentage of people say, whether right or wrong, theat these categories can do something about the boom: civilian authorities (60%), Air Force (59%), airplane

manufacturers (49%);

-finally, the lack of confidence in certain categories do not do everything possible): Air Force (36%), civilian authorities (34%), airplane manufacturers (27%), pilots (25%).

4 - ATTITUDE TOWARDS SUPERSONIC TRANSPORT AVIATION /20

Q. 35 - At the present time, there are traditional commercial airplanes which do not exceed the speed of 1,000 km per hour and other new airplanes, supersonic, that can exceed 2,000 km per hour. Compared to traditional commercial airplanes, do these supersonic airplanes seem to you:

-rather useful	61%
-rather unuseful	29%
-no opinion	10%
-rather expensive for clients	60%
-rather inexpensive	19%
-no opinion	21%
-interesting only for some passenger groups	58%
-equally advantageous for all passenger groups	29%
-no opinion	13%
-rather dangerous	49%
-rather undangerous	23%
-no opinion	28%
-more comfortable	67%
-not more comfortable	12%
-no opinion	21%
-indispensable	40%
-not more indispensable	47%
-no opinion	13%

Compared to subsonic aviation, supersonic transport aviation is judged by most people to be useful, more expensive, advantageous only for certain passenger groups, more risky, but more comfortable. /21 However, the percentage of people who did not answer these questions is relatively high (nearly one-third in some cases) and illustrates the lack of precise information available in this area.

A homogeneous dimension was found in five out of six items (Appendix IX).

5 - GENERAL SATISFACTION OF THE ENVIRONMENT

This attitude is described and evaluated by six homogeneous and questions arranged hierarchically. It reflects the satisfaction

expressed for different aspects of the environment: distraction facilities, public means of transport, proximity of stores, neighbors, proximity of schools and housing conditions (Appendix X).

The intensity curve shows that nine-tenths of the French people questioned consider themselves satisfied with their environment.

6 - CORRELATIVE ANALYSIS OF ATTITUDES

Calculation of correlations between the different attitudes (see table no. 4) leads to a few interesting general remarks.

First, it seems that the various attitudes evaluated are all independent from environment satisfaction. This result was already found in 1965 and is confirmed here. Likewise, as in 1965, there is a relatively high positive relationship between annoyance from noise and sensitivity to the boom on the one hand, and annoyance from the boom and sensitivity to the boom, on the other hand. Accordingly, those who are the most bothered by the noise (and more sensitive) tend to be those who are the most annoyed by the boom (or most sensitive to the boom).

On the other hand, there is no evidence of a relationship between these four attitudes and those towards civilian or military supersonic aviation.

This last result, and the connection between acceptance of /22
booms and the attitude towards supersonic transport aviation tends to illustrate that people who are the most favorable towards this aircraft are also those who most readily accept the booms, while having the same sensitivity towards them as other people. This fact illustrates the potential of changing attitudes towards supersonic aircraft by promoting an information campaign. This is because we have seen that sensitivity to the boom and particularly annoyance from the boom are based on psychological phenomena, where startling, irritation, fright play an important role.

7 - CONCLUSION OF CHAPTER III

If the dimensional analysis of attitudes shows that certain results substantiate those found in the survey conducted in 1965, it also shows changes illustrating that the French people now evaluate the boom more objectively than a few years ago.

It was actually observed that the general satisfaction of the environment and political leanings do not influence attitudes towards the boom. Likewise, the influence of educational level is decreasing.

These results combined with the fact that the people interviewed do not overestimate, but rather tend to underestimate the number of booms they hear. We can thus conclude that prejudices have little effect on the opinion of French people exposed to the boom.

TABLE 4

TABLE OF CORRELATIONS BETWEEN ATTITUDES

	a	b	c	d	e	f	g	h	i
j		.23	.91	.26	.38	-.16	-.13	-.09	-.04
k			.26	.36	.14	-.06	-.03	.03	-.03
l				.29	.42	-.19	-.17	-.10	-.04
m					.11	-.11	-.10	-.02	-.01
n						-.08	-.10	-.07	-.03
o							.87	.20	-.01
p								.19	.03
q									.03
r									

Significant values: .19 at threshold of .05; .25 at threshold of .01.

Key: a-Annoyance from the boom; b-Annoyance from noise; c-Sensitivity to the boom; d-Sensitivity to noise; e-Sensitization to the boom; f-Acceptance of booms caused by commercial aircraft; g-Acceptance of booms caused by military aircraft; h-Attitude towards supersonic transport aircraft; i-Satisfaction of the environment; j-Annoyance from the boom; k-Annoyance from noise; l-Sensitivity to the boom; m-Sensitivity to noise; n-Sensitization to the boom; o-Acceptance of booms caused by commercial aircraft; p-Acceptance of booms caused by military aircraft; q-Attitude towards supersonic transport aircraft; r-Satisfaction with environment.

CHAPTER IV - VARIABLES INFLUENCING ATTITUDES TOWARDS THE BOOM

We will examine in this chapter the variations of annoyance

from the boom and sensitivity to the boom as a function of sociological and psychological variables.

1 - INFLUENCE OF SOCIOLOGICAL VARIABLES

The following sociological characteristics were recorded for each person interviewed and studied in relationship with annoyance from the boom and sensitivity to the boom: /25

-age,
-sex,
-profession,
-income,
-educational level,
-owner or renter status,
-dwelling,
-number of children in the home,
-time spent in the region,
-political leaning.

Among all these variables, three are independent from attitudes towards the boom, and the others are related by various degrees and the threshold of .01 is usually selected.

1.1 - Sociological Variables Not Related to Attitudes /26

No connection could be brought to light for:

-political leaning, -time spent in the region, -number of children in the home.

With respect to political leaning, let us point out that 36% of the people interviewed refused to answer the corresponding question, but their attitudes towards the boom are not different from those who did answer.

The result found in 1970 was different from that of the 1965 survey. At that period "leftists" (communist party, SFIO sociologists, radicals) were more sensitive to the boom and were less interested in aeronautical progress. Today, these attitudes seem to have disappeared.

The non-influence of time spent in the region coincides with the general satisfaction with environment. The low mobility of the French population should be pointed out: 70% of the people questioned have lived for more than 10 years in the same region.

1.2 - Sociological Variables Related to Attitudes

Relationships were observed for the other seven variables, and are especially strong for six of them.

-Educational level (or cultural level) is a parameter often considered

as a tolerance factor. The assumption was thus made that there is the opposite relationship between educational level and annoyance or sensitivity to the boom. If this assumption is verified at the .05 threshold, it should nevertheless be pointed out that the difference observed is largely due to people who received a technical or business training. This is more a factor of specialized training than of the "general cultural level".

Finally, let us note that this relationship was more distinct /27 during the survey of 1965.

-Sex was selected as a sampling variable. Women were significantly (.01) more annoyed and more sensitive to the boom than men.

-Age generally reinforces resistance to change and makes it difficult to adopt new changes. Sensitivity to the boom and the annoyance experienced do not escape this rule and tend to increase with age. This result was already quite obvious in 1965. The age group of people 50 years and older is the most sensitive to the boom and that of 20 to 30 years is the least sensitive group.

-Profession. The first difference observed was of the so-called "non active" population group which was found to be more annoyed and more sensitive. This may be interpreted by using the American theory that the boom has different effects, depending on whether it is indoors or outdoors, as non-active people tend to spend more time indoors than others. However, this greater sensitivity is probably due to sex, as 74% of the "non active" group are women in our sampling.

For the profession itself, farmers seem to be the most annoyed and the most sensitive, whereas their evaluation of the number of booms heard is not different than other people in other professions.

-Living quarters. The effect of this variable was already brought to light by the investigation of 1965. The same was observed in 1970 for cities of 20,000 inhabitants. In urban centers of less than 20,000 inhabitants or in rural areas, the annoyance felt and the sensitivity to the boom are significantly (.01) higher.

This result may be due to the fact that flight routes avoid the largest urban centers, but also because of the sound environment of large cities.

-Status of Owner or Renter. The feeling of attachment to personal property illustrated by this parameter is related to the annoyance and sensitivity to the boom, with property owners being the most annoyed and the most sensitive (.01).

-Income Level. People in lower income groups are more annoyed and sensitive to the boom, the dividing line being at about 1,250 francs per month.

1.3 - The Table Below Summarizes the Results Found for Sociological /28 Variables.

TABLE 5

Impact of Sociological Variables

Variables	Threshold	Effects on annoyance and sensitivity to the boom.
Political leaning	-	None
Time spent in region	-	None
No. children in home	-	None
Educational level	.05	Annoyance and sensitivity decrease as the educational level increases (the trend is more distinct for people with technical training.
Sex	.01	Women are more easily annoyed and more sensitive than men.
Age	.01	Annoyance and sensitivity increase with age. 3 groups are distinguishable: 20-29 years, 30-49 years and +50 years.
Profession	.01	-"Non active" people are more easily annoyed and more sensitive. -In the active group, farmers are the most annoyed and the most sensitive.
Home Environment	.01	The most annoyed and sensitive people live in communities of no less than 20,000 inhabitants.
Status of property owner or renter	.01	Property owners are the most annoyed and the most sensitive.
Income level	.01	The most annoyed and sensitive individuals have an overall monthly income of less than 1,250 francs.

2 - IMPACT OF PSYCHOLOGICAL VARIABLES /29

The following variables were examined in relationship with annoyance and sensitivity to the boom:

2.1 - Variables Not Related to Attitudes

-Whether people like their living conditions or general environment has no effect on attitudes towards the boom, as we have already

shown above. The same is applicable to environmental noise which is indirectly estimated by the scale of annoyance from noise. These two results were already quite obvious in 1965.

-Whether people know about regulations restricting supersonic flights has no impact on attitudes, whereas we could have assumed that annoyance or sensitivity to the boom decrease as people become better informed about it; but this is only with respect to the existence and not the content of regulations.

-Impact of newspapers, technical magazines, t.v., publicity. Four questions were asked to determined how important these factors are on attitudes towards the boom.

Results show that people who are informed through the media are neither more nor less annoyed or sensitive to the boom than others.

Comparison with the results of 1965 is interesting from several points of view. First, the connection noted in 1965 (people who are the most informed are the least sensitive and conversely) is no longer true. We may thus conclude that there are less prejudices in this area. Moreover, people are more aware of current events today than in 1965 thanks to the radio and TV. This is illustrated by Table 6.

The influence of "mouth to ear" information is also greater than in 1965. "People talk about it" more and we will see that this parameter, in contrast to the preceding ones, is related to attitudes towards the boom.

2.2 - Variables Related to Attitudes

-Environmental impact has substantially more impact than mass media, since annoyance from the boom and sensitivity vary with this parameter. Rumors increase sensitivity to the boom; this means information currently affects 63% of the people interviewed, compared to 35% in 1965.

TABLE 6 /30

Question 27: Have you:	1965 yes %	1970 yes %
a) read newspaper or magazine articles on the boom or its effects?	53	56
b) read about the boom and its effects in specialized technical reviews?	5	8
c) heard about the boom and its effects on radio or TV?	30	58
d) heard about the boom and its effects from relatives, friends, colleagues, neighbors, etc.?	35	63

-The feeling that an increase in the number of booms heard is significantly related (.01) to greater annoyance and sensitivity to the boom. This effect does not have the inverse relationship: no change was observed when the frequency of the number of booms heard decreases. If this result shows the limits in the objectivity of judgments made on the effects of the boom and the boom itself, it nevertheless confirms the result obtained in 1965.

-The belief that damages are caused by booms is also a variable related to attitudes. Let us recall that the people interviewed had never sued for damages or annoyance and only 11% of them were aware that people in their neighborhoods had filed suits. Their answer to question no. 21: To your knowledge, do booms ever cause damages? is based on more a general impression than on knowledge of objective facts. /31

The assumption made here that the psychological medium of the sensitivity to the boom (and annoyance declared) was the fear of damages, especially material damage. This assumption is thus confirmed, as those who are the least sensitive or the least annoyed are those who consider that the boom practically never causes damage (40% of the population sample questioned).

Need for Supersonic Aviation. Opposite to the fear of damages is the awareness of the practical aspect of supersonic aviation. It is illustrated that people who consider supersonic transport aviation indispensable (A. 35 f) are the least sensitive to the boom (result already found in 1965).

2.3 - The Next Table Summarizes the Results Found For Psychological Variables. /32

CHAPTER V - VARIATION OF ATTITUDES WITH THE FREQUENCY OF EXPOSURE TO SUPERSONIC FLIGHTS

For the purpose of analyzing the variation of attitudes as a function of the degree of exposure, a representative sample of the population was created for each frequency band. /33

1 - HOMOGENEITY OF SAMPLES

The population breakdown of the five frequency bands proved to be quite different for each profession and type of community. As a result:

-the percentage of farmers is much higher in band F_3 (31 to 60 booms per month), whereas it was low in band F_5 (more than 90 booms per month);

-the percentage of inhabitants from communities of less than 20,000 people is considerably higher for bands F_3 and F_4 (respectively 31 to 60 and 61 to 90 booms per month), whereas it was low for band F_2 (11 to 30 booms per month).

TABLE 7 /32

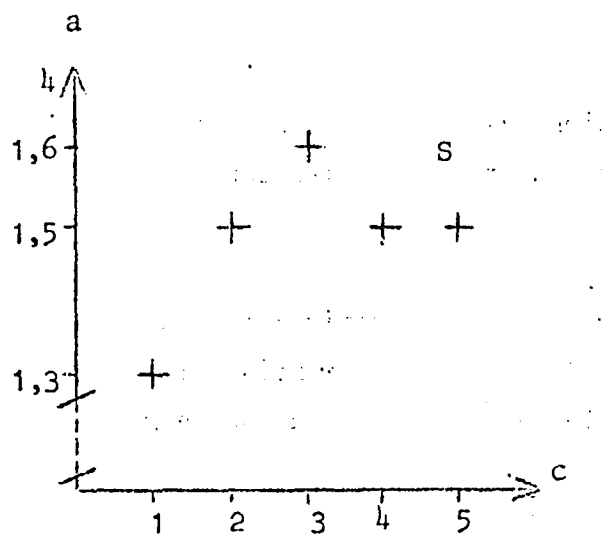
Variables	Threshold	Observations of Annoyance and Sensitivity to the Boom
Satisfaction with living conditions in region	-	no correlation
Estimate of intensity of ambient noise	-	no correlation
Awareness of the existence of regulations controlling the boom	-	no correlation
Impact of newspapers or magazines	-	no correlation
Impact of radio or TV	-	no correlation
Impace of environment	.01	The surroundings makes on sensitizes to the boom
Estimate of changes in the number of booms	.01	Annoyance and sensitivity increase when people think the number of booms increases, but it does not decrease for the opposite case.
Belief that booms cause damage	.01	Annoyance and sensitivity increase
Supersonic aviation is indispensable	.01	People who believe supersonic aviation is indispensable are those who are the least annoyed and the least sensitive.

This difference in the representative samples corresponding to /34 the different frequency bands is a fact which must be taken into account in order to interpret the results presented next.

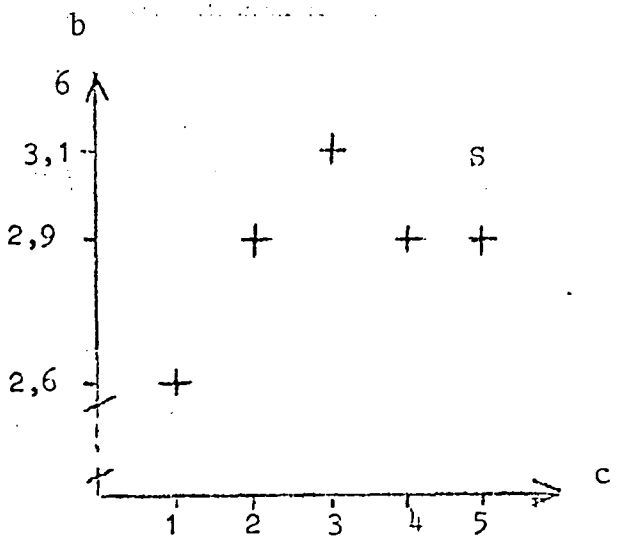
2 - ANNOYANCE FROM THE BOOM AND SENSITIVITY TO THE BOOM

2.1 - An overall analysis of results brought to light the existence of a positive relationship (at threshold .01) between annoyance, sensitivity to the boom and the frequency of exposure to supersonic flights. We may thus conclude that there is less than one chance in a hundred of being wrong that annoyance from the boom increases as the number of booms increases.

Nevertheless, this rough result should be considered in more detail. Let us examine the following graphs of variations.



Annoyance
Figure 1 - Annoyance



Sensitivity
Figure 2 - Sensitivity

Key: a-Rating out of 4; b-Rating out of 6; c-Bands

They illustrate that the population samples of five frequency bands are not identical for the annoyance or sensitivity expressed. The population sample of band F_1 is the lease annoyed and the least sensitive, that of band F_3 seems to be slightly more sensitive.

Statistical testing, however, shows that the only difference /35 is between band F_1 and the other bands, with no significant difference appearing between the four most exposed population samples.

It therefore seems that annoyance from the boom and sensitivity increase with the number of booms, but only up to a relatively low frequency of 30 booms per month, approximately. Above this level, the degree of annoyance remains rather constant.

2.2 - The results found from the intensity curves for each frequency band (Table 8) confirm the small difference between the highest frequency bands and between the first and second band.

TABLE 8

a / b	* 0 10	* 11 30	* 31 60	* 61 90	e 90
c	23	30	41	31	25
d	40	42	53	51	48

Key: a-Monthly frequency of exposure; b-Attitudes; c-Annoyance from the boom (%); d-Sensitivity to the boom (%); *to; e-More than.

Under these conditions, can we speak of becoming used to the boom? Without going that far, because of the low frequency range of booms, we may conclude that the reactions in the present frequency range are quite stable (0 to 130 booms per month).

A finer breakdown of the frequency bands did not provide a more accurate result.

2.3 - As the percentages of people annoyed or sensitive to the boom shown above relate to the people identifying the boom, it seemed of interest to correlate them to a sample representing the entire French population. We can actually combine the people who are not annoyed and who identify the boom with those who do not hear or identify the boom.

TABLE 9

a / b	* 0 10	* 11 30	* 31 60	* 61 90	e 90
c	13	25	36	30	23
d	23	36	47	49	44

Key: a-monthly frequency or exposure; b-Attitudes; c-Annoyance from the boom (%); d-Sensitivity to the boom; (%); e-more than.

Accordingly, one person in five of the French population is annoyed by booms in regions with the smallest density of exposure. This annoyance amounts to one in three for other regions.

3 - THE "CONCORDE" ROUTE

Since October 1969, the Franco-English Concorde has performed a few supersonic flights above French territory following a defined route from Istres to Cazaux (Appendix I).

It was interesting to discover whether the people exposed to the Concorde booms in addition to the "usual" booms of military aircraft had different opinions or attitudes. This did not happen. A comparison of attitudes of people concerned by these flights and those of people hearing the boom did not bring to light any difference in the annoyance to the boom, sensitivity to the boom, acceptance of booms produced by civilian or military supersonic aircraft and the attitude towards commercial supersonic aviation.

4 - FREQUENCY OF EXPOSURE AND OTHER ATTITUDES /37

4.1 - Environmental Satisfaction

An inverse relationship between this attitude and the frequency of exposure were observed (figure no. 3): people of regions overflown by the supersonic airplanes the most frequently are the least satisfied with their environment. However, since the environment defined by this survey is mainly socio-economic and this attitude is not related to another one (sensitivity to the boom), there is no reason to interpret this connection in terms of cause and effect.

In fact, a third factor is related to the first two factors, namely, flights are performed by preference over the least populated regions which are also the most advantageous in terms of socio-economic considerations.

4.2 - Sensitivity to Noise /38

This attitude is independent from the frequency of exposure to booms (figure No. 4), although relatively related to annoyance and to sensitivity to the boom.

4.3 - Acceptance of Booms and Attitudes Towards Commercial Supersonic Aviation

Whether produced by military or civilian airplanes, booms are more widely accepted as the frequency of exposure is higher (figures 5 and 6). This is also true for the attitude towards supersonic transport aircraft (figure 7).

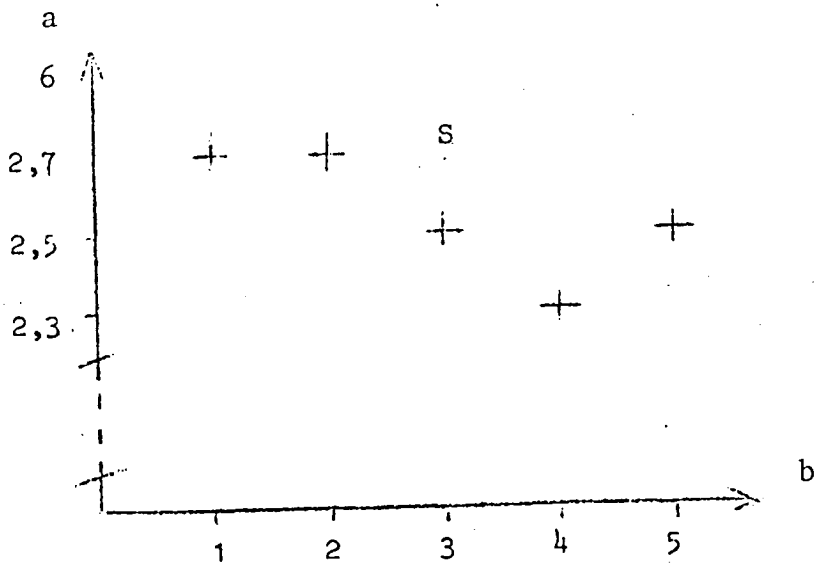
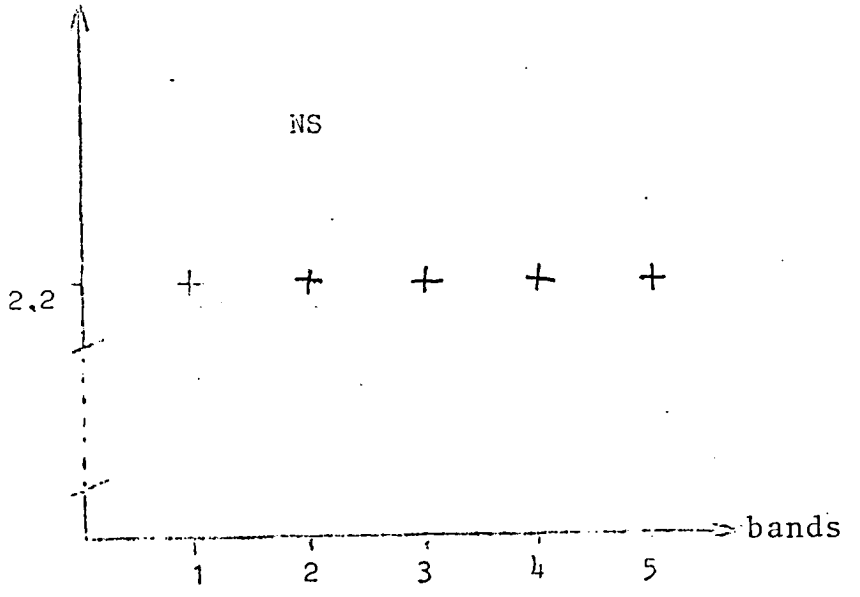


Figure 3

Key: a-Rating out of 6; b-Bands.

Rating out of 6



/38

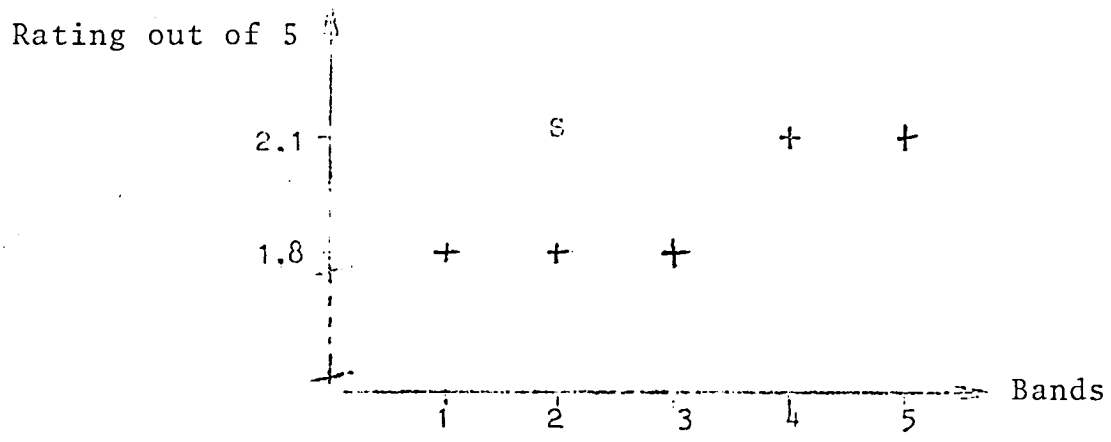
Figure 4

This paradoxical result is difficult to interpret in the present situation. It could be caused by familiarization with the boom phenomenon, as this is the case for attitudes towards the boom, annoyance and sensitivity. As annoyance or sensitivity to the boom do not increase with the present conditions of frequency of exposure, attitudes towards technical progress, industrial and aeronautics progress are becoming more favorable to the extent that objective actions are being taken, such as taking out patents. The boom thus becomes associated with objective actions.

CHAPTER VI - SYNTHESIS TEST OF ATTITUDES /41

In order to provide a synthesis of results for this survey as objectively as possible and to test the general consistency of these results, a factorial analysis was performed (centroid method) of 16 variables that seemed to be the most important.

Analysis of the table of correlations between these variables (Appendix XI) makes it possible to summarize the observations and facilitate their interpretation.



/39

Figure 1

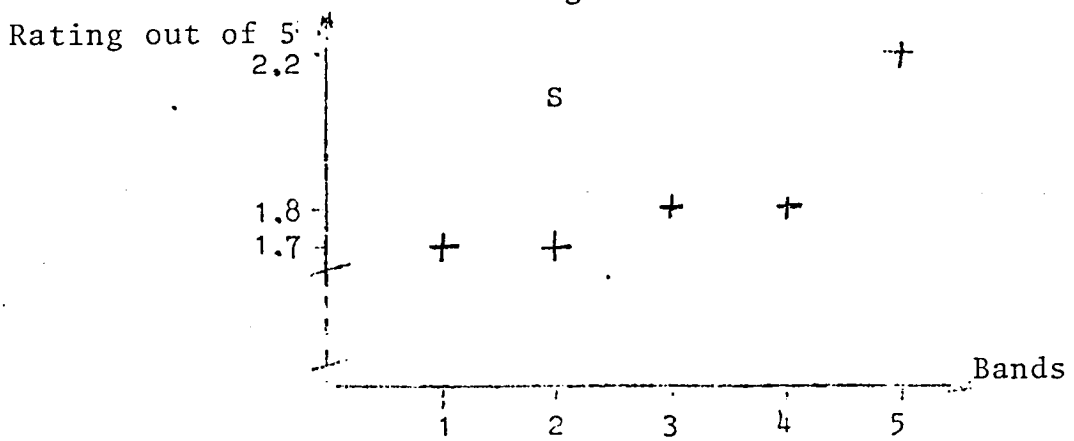


Figure 2

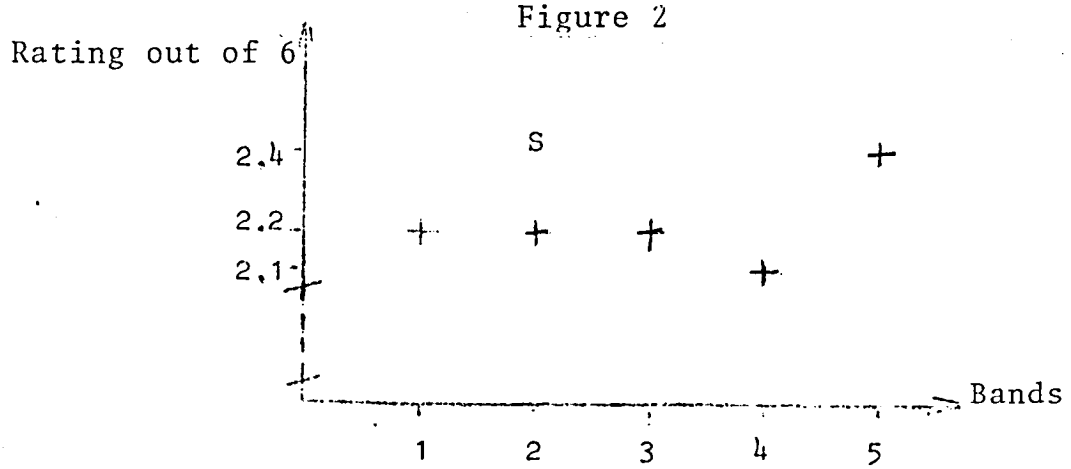


Figure 3

the observations and facilitate their interpretation.

Three practically independent factors were defined and 89% of the total variance was explained (table 10).

1 - ANNOYANCE AND SENSITIVITY TO THE BOOM

This is the most important factor explaining in itself 46% of the total variance. We may observe by order of decreasing saturation (influence of the factor):

-sensitivity to the boom

-annoyance from the boom

then to a less degree: /42

-sensitivity to noise

-"sensitivization" to the boom

-annoyance from noise

This first factor brings to light the psychological factors, and confirms their importance, in terms of sensitivity and annoyance towards the boom. It also shows that the boom is experienced as a noise.

2 - ACCEPTANCE OF BOOMS CAUSED BY SUPERSONIC AVIATION

This second factor represents 30% of the total variance. It is also very pure and is exclusively represented by attitudes towards military and civilian supersonic aviation as producers of booms. It shows the attitude of the people interviewed towards the development of supersonic aviation and the various degrees of acceptance of its expansion into new regions and, hence, the expansion of booms.

3 - SOCIO-ECOLOGIC FACTOR

This third factor represents 24% of the total variance. It classes objective variables used in this analysis in the order of decreasing saturation:

-income

-educational level

-type of community

-age.

It also includes two attitudes: one towards information produced by the different means of mass communication (newspapers, magazines, radio, TV, environment) and the attitude towards commercial supersonic /43

aviation in comparison with current transport aviation.

4 - CONCLUSION OF CHAPTER VI

Examination of these three factors shows the characteristic differences relative to the factorial structure found in 1965.

The socio-cultural factor ranks first, with two other factors - geographic and ecologic - ranking next. Analysis of variables contributing to these factors illustrates the importance of sociological factors in attitudes towards the boom; the value of annoyance from the boom could not be brought to light in a distinct manner. Reactions to the boom thus seem to be full of prejudices and at the same time express a certain consistency.

Socio-ecological variables form a separate factor that is quite distinct from the others. It ranks third and constitutes only one-fourth of the attitudes expressed.

Attitudes towards the boom in 1970 seem to be filled with less prejudice: the expression of annoyance may therefore be accepted as a relatively objective value.

Finally, the last observation confirming the results found above is that the frequency of exposure to booms does not affect the three determined factors or environmental satisfaction.

The following table assembles the results of this analysis.

CHAPTER VII - PLAINTIFFS /45

The number of suits for damages is generally considered to be an objective indication of the annoyance caused by supersonic flights. We can also wonder if current flight regulations do not directly influence the number of suits, seriousness of damages as a function of the distance of the place where damages occur from the aircraft trajectory over the ground. Moreover, some people may have an inclination to sue which is set off by the opportunity to protect their possessions. Finally, we should determine to what extent this annoyance caused by material damages can become a permanent and unfavorable attitude towards supersonic aviation.

The 283 plaintiffs interviewed represent half of the 570 suits filed during the nine months preceding the survey.

1 - DAMAGES

Statements made by these plaintiffs questioned during the survey were compared with the records of suits filed.

The declared damages correspond to statistics established by other means: /46

-broken glass (windows)	35%
-cracks, chinks (walls, ceiling)	30%
-collapse (ceiling, walls, roof)	23%

TABLE 10

/44

VARIABLES \ FACTORS	I	II	III
Sensitivity to the boom	.911	.102	-.144
Annoyance from the boom	.867	.151	-.156
Sensitivity to noise	.436	-.125	.203
Sensitization to the boom	.434	.032	-.148
Annoyance from noise	.427	-.089	.220
Acceptance of commercial aircraft booms	-.230	.838	.052
Acceptance of military aircraft booms	-.206	.821	.061
Income	-.078	.132	.607
Cultural & educational level	-.040	.058	.514
Type of community	-.153	.068	.362
Age	.090	-.174	-.314
Information on the boom	.167	-.066	.313
Attitude towards supersonic transport aircraft	-.071	.185	.296
Sex	.125	.120	-.078
Frequency of exposure to supersonic flights	.098	.099	.013
Satisfaction of environment	-.054	.037	.107
% total variance	46 %	30 %	24 %

-miscellaneous damages (fallen objects) 10%

2 - SUITS

The number of suits for a given number of flights is about the same in 1969 and 1970.

To file a suit, plaintiffs file suits with police stations (54%), the town hall (15%), insurance agents (11%), the Air Force (8) (8%) or with other military institutions (4%).

The procedures to follow seem rather or very simple to 67% of the plaintiffs.

At the time of the survey, of 39% of the filed suits had not received an authorized decision, 31% were discarded and 29% were granted full or partial compensation. 6% of the rejected plaintiffs expressed the intention of continuing their action in court.

3 - SOCIOLOGICAL CHARACTERISTICS

Let us recall that the three following representative samplings were created:

-French people 20 years old or more living in departments overflown by supersonic aircraft;

-French people 20 years old or more living in departments where the boom is perceivable and identified;

-Those who sue for damages.

Comparisons of these three sampling groups show that there is /47
no difference between the first two groups, but the third group is statistically differentiated (.01) from the other two groups for numerous sociological variables.

With a higher educational level than the average person in the general population group interviewed, the plaintiffs are the following:

-men (72%)

-45 years old or more (77%), or even older than 65 (32%)

-owners of their living quarters (82%)

-residents of a rural community (56%) or an urban center of less than 10,000 inhabitants (15%)

-farmers or small businessmen (40%) who are no longer active (34%)

-state they have a monthly income exceeding 1,250 francs (45%)

-state they vote for the government majority: UDR (23%); Independent

Republican (15%); (34% did not state how they vote).

4 - ATTITUDE OF PLAINTIFFS

Comparison of the plaintiff population group with the population group that hears the boom leads to the following conclusions:

The plaintiffs do not have a different attitude about satisfaction towards their environment, sensitivity to noise, annoyance from noise and commercial supersonic aviation.

Conversely, their "sensitization" to the boom is greater and their sensitivity is also higher. The annoyance felt is stronger and this is probably why they accept booms less readily, whether produced by military or commercial aviation.

This overall analysis seems consistent if we assume that damages created special attitudes towards the boom. It should be noted that the survey conducted in 1965 brought to light the contrast between /48
plaintiffs and the general population towards the type of annoyance felt: material damages for plaintiffs and startling effects for the others.

We can also wonder if indemnifications had an influence on attitudes. Consequently, differences in attitudes were analyzed in more detail by accounting for the results of suits filed based on answers to question 42. This question breaks down the plaintiff group into four classes according to decisions made towards their case:

1 - Full reimbursement for damages,

2 - Partial reimbursement

3 - Rejection of the suit

4 - Suit under review.

Analysis shows that the plaintiffs seem heterogeneous: the first group contrasts to the three other groups, especially the third one. Rejection of the suit seems to cause negative attitudes. Conversely,

full reimbursement for damages causes plaintiffs to readopt the same attitudes as the general population.

The next table compares attitudes of the general population perceiving the booms with those of the plaintiffs:

CONCLUSIONS /51

The opinion survey conducted in France in November 1970 seems to be the first one to have investigated as objectively as possible a factor of prime importance - the frequency of exposure to supersonic booms - with the population sample interviewed within their natural environment.

The results seem particularly interesting due to their consistency and can be summarized as follows.

Among the pollutions of modern life, the boom ranks third after cancer and road accidents. It ranks with air pollution and higher than noise. It does not belong to life-threatening pollutions, but to those which have a long term risk.

A semantics analysis of attitudes towards the boom using an appropriate technique (hierarchical analysis) provided a working definition of the concept of annoyance on the basis of the consistency of the opinions collected. Accordingly, the boom is differentiated from noise due to the type of reactions it creates: it creates startling effects and a feeling of irritation, even fear, and it does not interfere with daily activities. If the boom is perceived

TABLE 11

/49

Attitudes	Threshold	Observations
Annoyance from noise	-	Plaintiffs are neither more nor less annoyed by the noise.
Sensitivity to noise	-	Plaintiffs are neither more nor less sensitive to noise.
Attitude towards supersonic transport aircraft	-	Plaintiffs do not have more or less favorable attitude towards commercial supersonic aircraft.
Satisfaction with environment	.05	Plaintiffs are less satisfied with local environment.
Annoyance from the boom	.01	Plaintiffs are more annoyed by booms than other groups.
Sensitivity to the boom	.01	Sensitivity to the boom is stronger among plaintiffs.
Sensitization to the boom	.01	Plaintiffs are more sensitized to booms than other groups.
Acceptance of booms produced by commercial aircraft	.01	Plaintiffs accept booms of commercial aircraft less than other sample groups.
Acceptance of booms produced by military aircraft	.01	Plaintiffs accept booms of military aircraft less than other sample groups.

as a noise, the annoyance it creates cannot be dissociated from its psychological repercussions. This is in contrast to noise for which behavioral aspects and sensitivity are much easier to distinguish and corresponds to quite different attitudes.

Examination of the frequency of exposure to supersonic flights shows that annoyance increases with this frequency. This annoyance seems to reach a plateau quite fast at about 30 to 60 booms per month.

These results should be considered for cases where a maximum of 4 to 5 booms per day are observed. We cannot yet draw any conclusions for higher frequencies of exposure. With these conditions taken into consideration, the percentage of people who say they are annoyed by the boom varies from 26% for the lowest frequencies of exposure to 33% for the highest frequencies.

Finally, when results of the 1970 survey are compared with those of 1965, some results are confirmed. However, there is a big difference in the effects of socio-cultural variables on attitudes towards the boom: ranking first in 1965, these variables now rank third and constitute only about one-fourth of the influencing factors. It therefore seems that preconceived ideas and prejudices about the boom are diminishing, if not disappearing; for example, attitudes towards it are no longer influenced by political leanings or satisfaction with the environment and are less influenced by cultural or educational level.

For the essential problem of information, conclusions of the investigation of 1965 point to the necessity of promoting propaganda campaigns at the cultural level, particularly at the lower levels. It seems that public opinion in 1970 is becoming more homogeneous about this thanks to radio and TV. If a distinguishing action no longer seems necessary, the results obtained until now through objective information are encouraging enough to continue this action: the situation seems more clear, attitudes towards the boom are assuming their own dimension without interfering with those towards supersonic aviation.

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APPENDIX I

MONTHLY AVERAGES OF SUPERSONIC FLIGHTS

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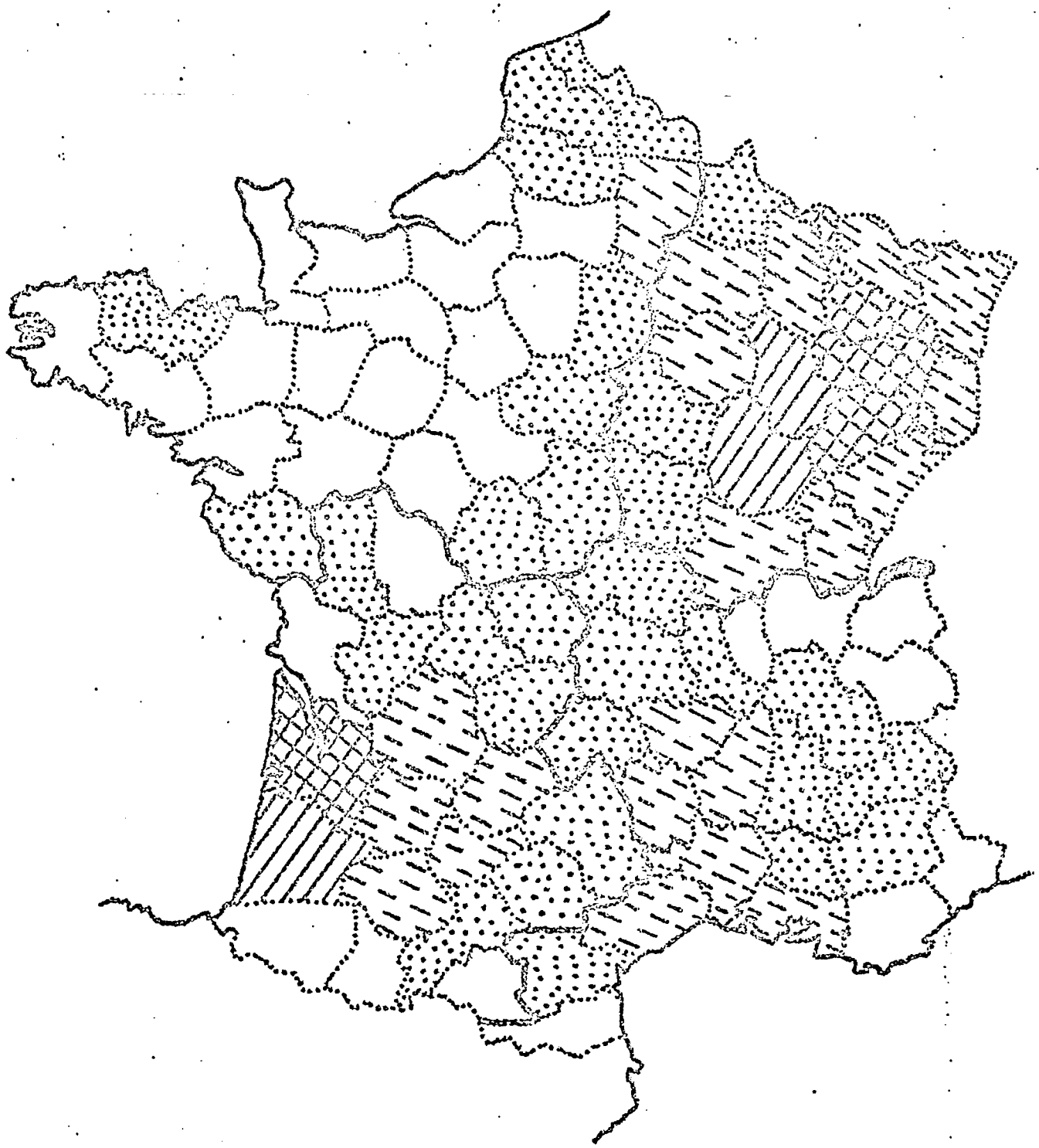


Figure 1

F.1 0-10

F.2 11-30

F.3 31-60

F.4 61-90

F.5 above 9

APPENDIX 1-2

MONTHLY AVERAGES OF SUPERSONIC FLIGHTS

1 9 7 0

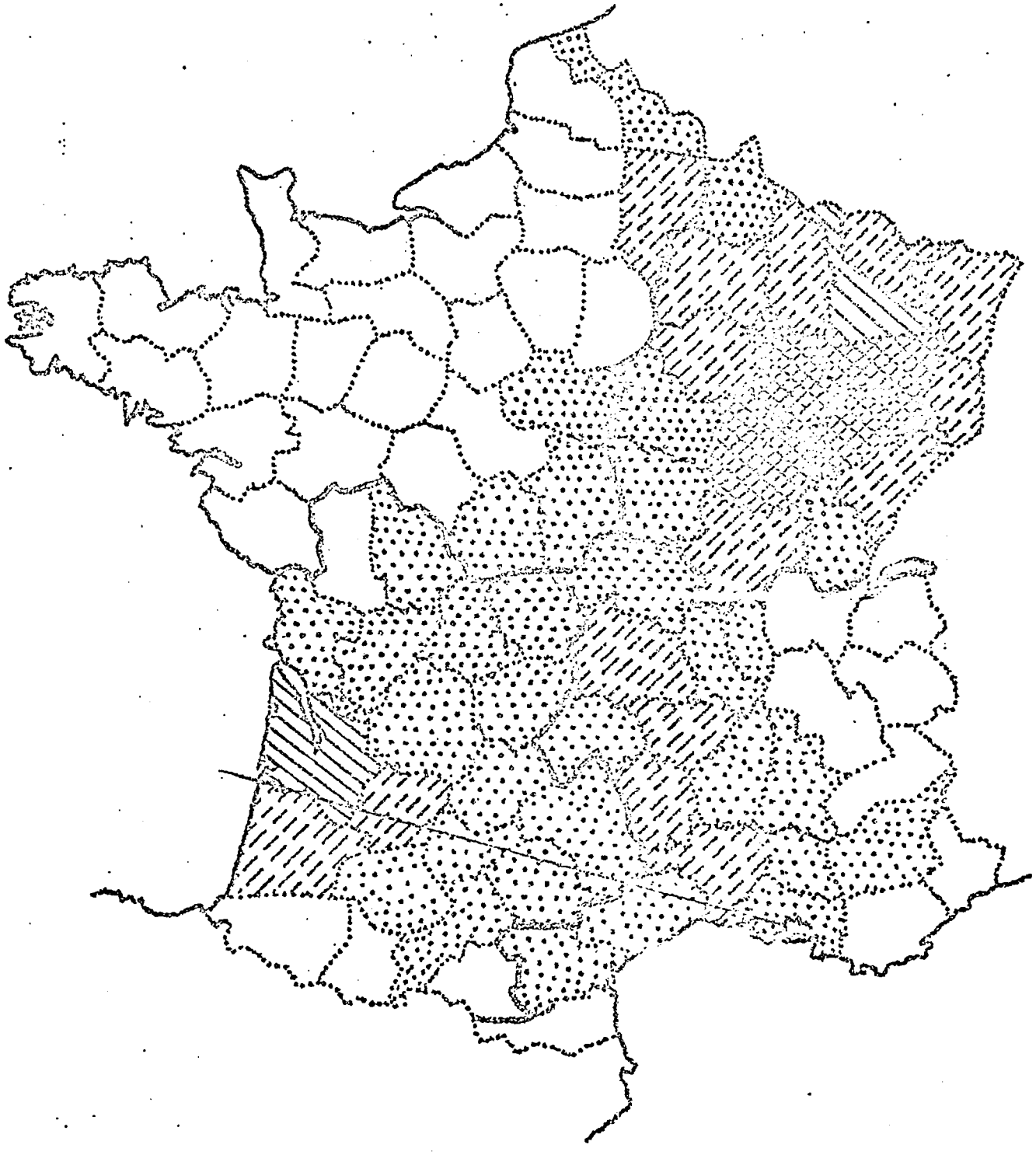


Figure 2

F.1 0-10

F.2 11-30

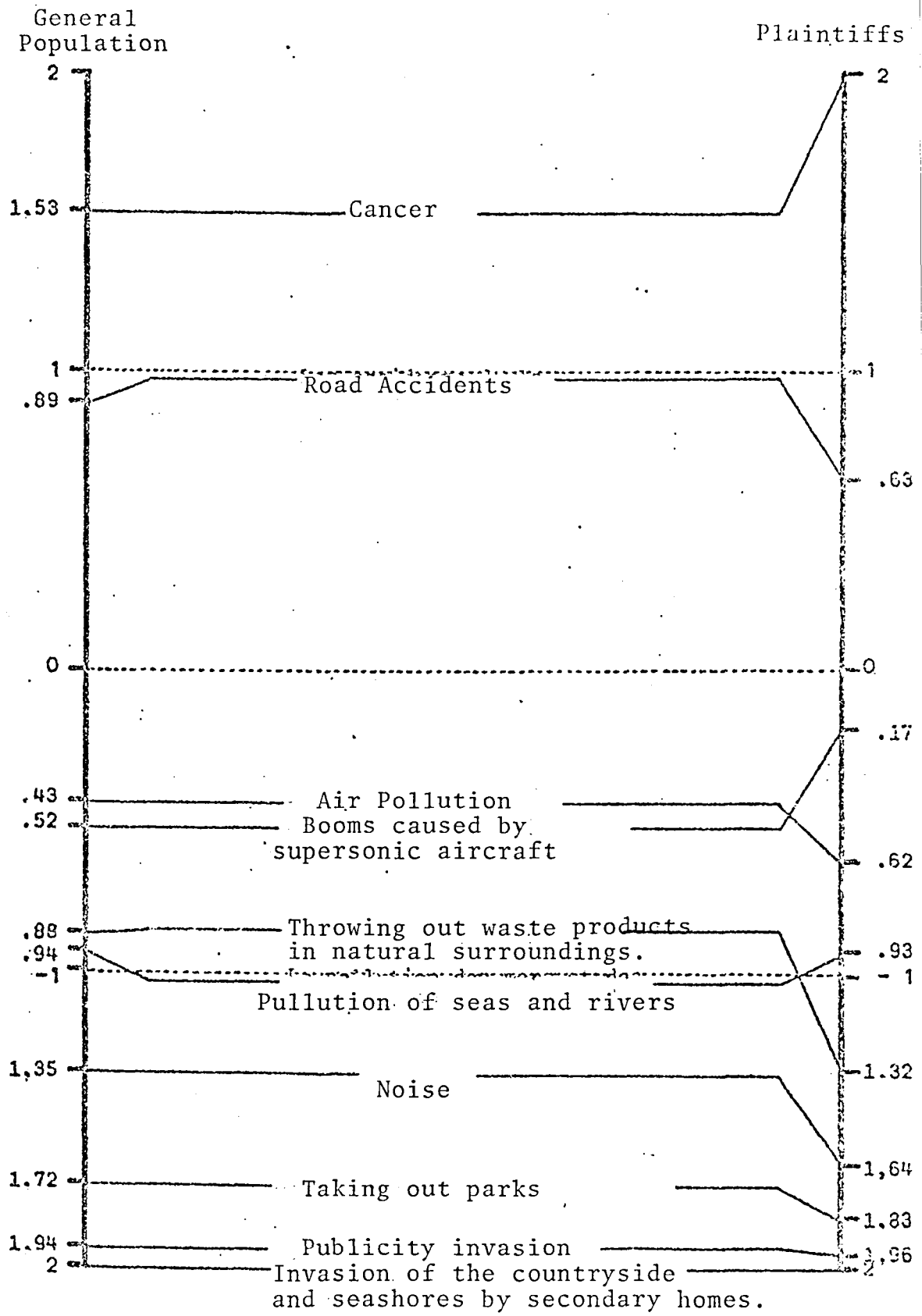
F.3 31-60

F.4 61-90

F.5 above 90

APPENDIX II

CLASSIFICATION OF TODAY'S POLLUTIONS INTO FOUR PRIORITY LEVELS



Ratings distribution was limited to à ± 2,00 σ

APPENDIX III

Annoyance from Noise - Attitude Scale

(H = .34, K = .37, CR = .93)

Q. 11-Do the noises you hear bother you a lot? Moderately? Little or not at all? Specifically:

a - in your work or daily activities:

considerably or moderately. 13%

b - in your sleep?

considerably or moderately 18%

c - in your conversations?

considerably or moderately 18%

f - do they disturb radio, TV listening?

considerably or moderately 26%

g - do they vibrate your house?

considerably or moderately 47%

APPENDIX IV

Annoyance From the Boom - Attitude Scale

(H = .58, K = .51, CR = .95)

Q. 20 - Do the booms you hear annoy you considerably? Moderately? Little or not at all? Specifically:

e - in your work or in your daily activities?

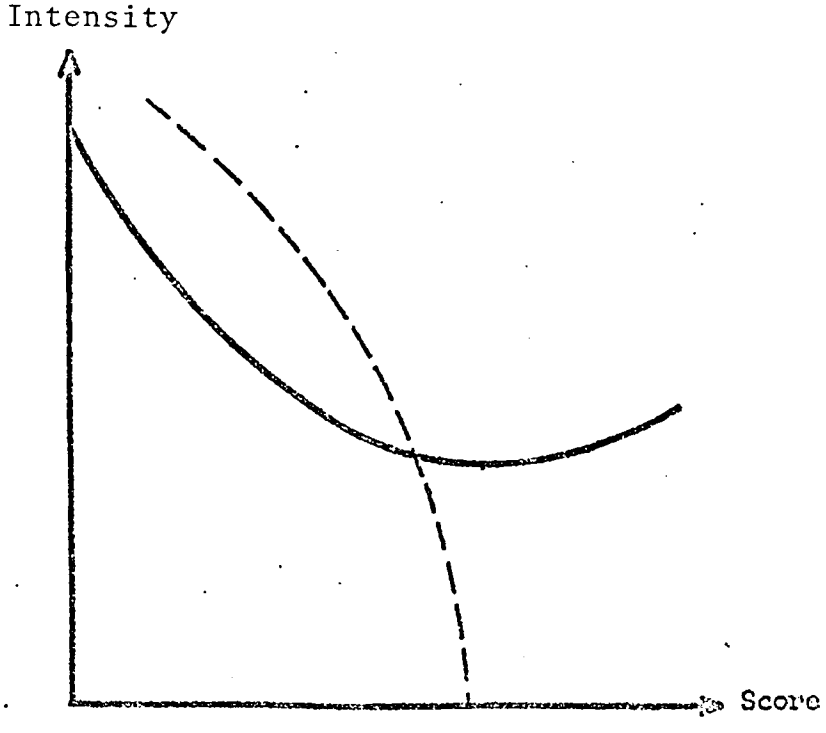
considerably or moderately 12%

k - do they frighten you?

considerably or moderately 26%

j - do they startle you?

considerably or moderately 69%



APPENDIX V

Sensitivity to the Boom - Attitude Scale

(H = .64, K = .53, CR = .95)

Q. 20 - Do the booms you hear annoy you considerably? Moderately? Little or not at all? Specifically:

d - for concentration (reading, writing, thinking, etc.)?

considerably or moderagely? 15%

k - do they frighten you?

considerably or moderately? 26%

i - do they irritate you?

considerably or moderately? 41%

Q. 18 - Would you personally say that you are annoyed by the boom considerably, moderately, little, very little or not at all?

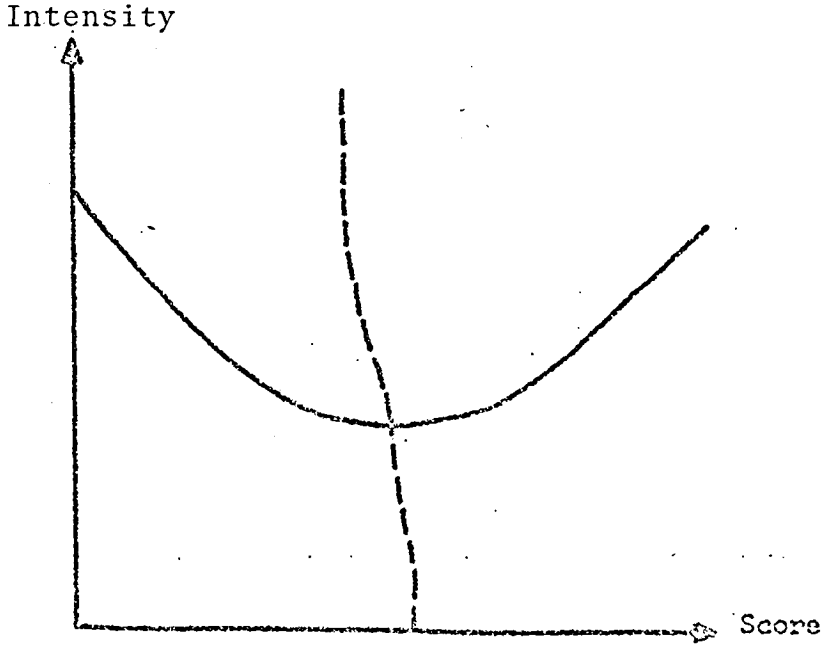
considerably or moderately? 52%

Q. 20 - Do the booms you hear startle you?

considerably or moderately? 69%

Q. 25 - If booms would ever occur at night, would you say you find this unacceptable? Rather difficult to accept? Acceptable? Insignificant?

Absolutely unacceptable or fairly difficult to accept 88%



Not very sensitive 51% ⟷ 49% sensitive

APPENDIX VI

Sensitivity to Noise - Attitude Scale
(H = .46, K = .41, CR = .92)

Q. 4 - Do the noises you hear annoy you considerably, moderately, little or not at all?

Considerably 11%

Q. 6 - On the whole, when there is a noise around you, do you find it unbearable, rather disagreeable, indifferent, rather pleasant?

Unbearable 19%

Q. 7 - When you hear noise, does it make you much more nervous, more nervous, a little more nervous, or not more nervous than usual?

much more nervous. 29%

Q. 8 - What kind of noise awakens you? Any noise, a fairly weak noise, a fairly strong or very strong noise:

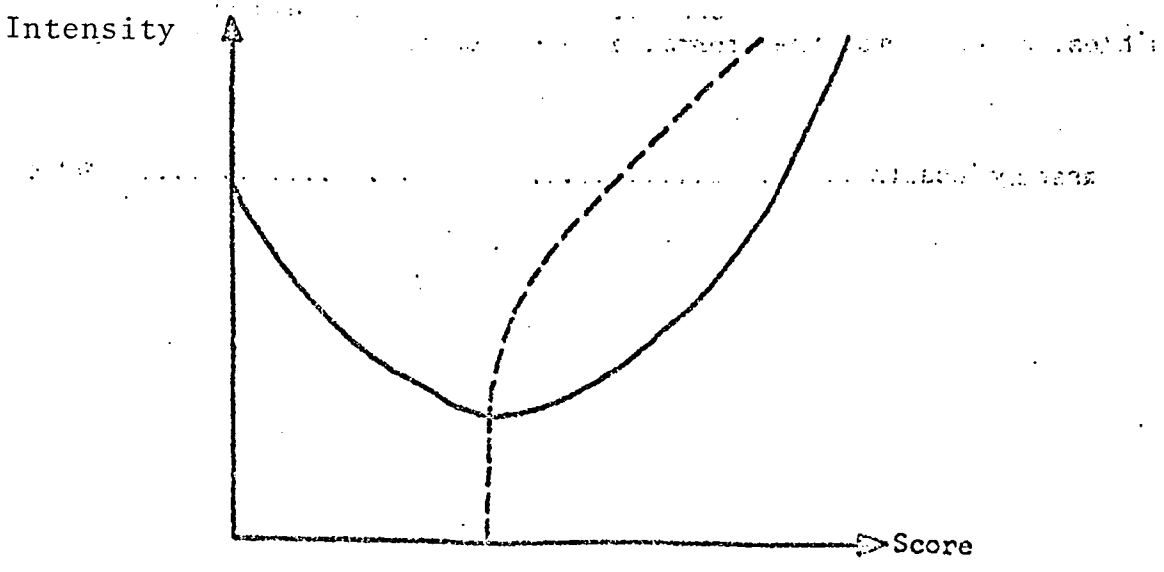
any noise or a fairly weak noise 43%

Q. 9 - On the whole, does noise tire you a lot, moderately, a little or not at all?

a lot or moderately 55%

Q.10 - The fact that you live in a noise environment, could this affect your health? Deep influence, some influence, rather little influence or no influence at all:

a deep influence or some influence 65%



barely sensitive 43% ⟷ 57% sensitive

APPENDIX VII

Sensitization to the Boom - Attitude Scale
(H = .90, K = .88, CR = .99)

Q. 24 - Compared to two years ago, would you say that today the boom annoys you more, neither more nor less?

the boom annoys you more than before 13%

Q. 23 - Do you think that the number of booms over the past two years has increased a lot, somewhat, stayed the same, has decreased, has decreased a lot?

has increased a lot or a little 28%

Q. 17 - Are the booms you hear generally very weak, fairly weak, fairly strong, very strong, deafening?

very strong or deafening 42%

APPENDIX VIII

ACCEPTANCE OF BOOMS PRODUCED BY SUPERSONIC AIRCRAFT

Attitude Scales

Commercial aviation scale: H = .34, K = .30, CR = .92

Military aviation scale: H = .38, K = .35, CR = .95

Q. 36 - In your opinion, should supersonic aircraft - commercial or military - be authorized to produce booms in the following locations:

a. Commercial Aircraft	b. Military Aircraft
-over the entire national territory	
yes 12%	yes 12%
-in the mountains during winter	
yes 22%	yes 22%
-near airports	
yes 35%	yes 33%
-in regions of small population density	
yes 51%	yes 48%
-at high altitudes	
yes 74%	yes 71%

APPENDIX IX

ATTITUDE TOWARDS SUPERSONIC TRANSPORT AVIATION

Attitude Scale

(H = .40 K = .41, CR = .92)

Q. 35 - At present, there are traditional commercial aircraft which do not exceed the speed of 1,000 km/h and other new supersonic aircraft that can fly faster than 2,000 km/h. Compared to traditional aircraft, do these supersonic aircraft seem more expensive or less expensive for clients, an advantage only for some categories of passengers or for anyone who travels by air, indispensable or not indispensable, rather useful or unuseful, more comfortable or not more comfortable?

-less expensive for clients 19%

-equally advantageous for anyone who takes the airplane 29%

-indispensable 40%

-rather useful 61%

-more comfortable 67%

APPENDIX X

GENERAL SATISFACTION WITH ENVIRONMENT

(Attitude Scale)

(H = .27, K = .23, CR = .92)

Q. 2 - Are you very satisfied, fairly satisfied, rather dissatisfied or very dissatisfied with:

g - amusement facilities in your neighborhood

very satisfied 8%

f - are public means of transport at your disposal?

very satisfied 21%

e - proximity of stores

very satisfied 33%

b - your neighbors

very satisfied 48%

d - proximity of schools

very satisfied or fairly satisfied 67%

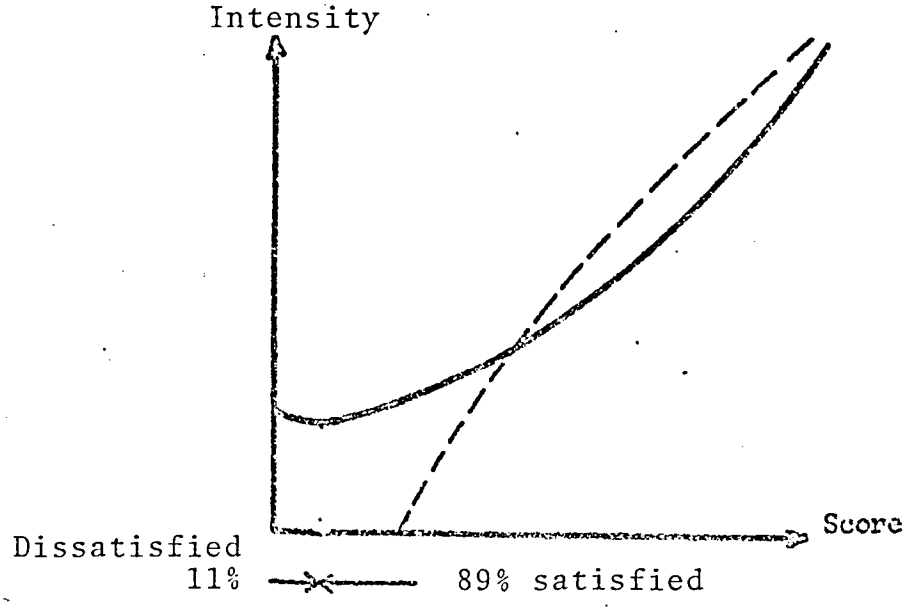


TABLE OF INTERRELATIONSHIPS

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.	Annoyance from the boom	--	.23	.91	.26	.38	-.16	-.13	-.09	-.04	.11	-.10	-.06	.20	.08	-.16	.06
2.	Annoyance from noise		--	.26	.36	.14	-.06	-.03	.03	-.03	.15	-.01	.04	-.04	.05	.03	.08
3.	Sensitivity to the boom			--	.29	.42	-.19	-.17	-.10	-.04	.13	-.10	-.08	.18	.10	-.17	.06
4.	Sensitivity to noise				--	.11	-.11	-.10	-.02	-.01	.15	.01	.04	.10	.10	.07	-.03
5.	Sensitization to the boom					--	-.08	-.10	-.07	-.03	.06	-.08	-.11	-.01	-.11	.10	.06
6.	Accep. booms commercial av.						--	.87	.20	-.01	-.05	.10	.07	-.03	-.08	.11	.07
7.	Accep. booms military av.							--	.19	.03	-.04	.09	.05	-.03	-.08	.11	.07
8.	Att. towards supersonic transport av.								--	.03	.10	.20	.12	-.06	-.20	.11	.08
9.	Satisfaction with environment									--	-.02	.11	.02	.04	.03	.19	-.03
10.	Information about boom										--	.19	.19	-.19	-.06	-.01	.05
11.	Income											--	.32	-.04	-.31	.27	.02
12.	Education level												--	-.05	-.33	.17	.02
13.	Sex													--	-.01	.01	.01
14.	Age														--	-.01	-.02
15.	Types of communities															--	-.07
16.	Boom frequency																--

Significant values of r: at threshold .05 = .19; at threshold .01 = .25

APPENDIX XII

FREQUENCIES OF ANSWERS TO DIFFERENT QUESTIONS OF THE SURVEY GIVEN BOTH TO THE GENERAL POPULATION AND TO PLAINTIFFS

(The percentages were calculated for the population sample "identifying the boom, except for those of questions 12, 13 and 14 which refer to the entire population sample questioned).

QUESTION NO.		General Population	Plaintiffs
1	-On the whole, how do you find your living conditions here? Would you say they are:		
	.no answer	0	
	.very satisfying	10	12
	.fairly satisfying	60	58
	.not very satisfying	25	22
	.not satisfying at all	5	6
2	-Are you very satisfied, fairly satisfied, fairly dissatisfied with:		
	a) your living quarters?		
	.no answer	0	1
	.very satisfied	39	37
	.fairly satisfied	47	50
	.fairly dissatisfied	11	9
	.very dissatisfied	3	3
	b) your neighbors?		
	.no answer	2	2
	.very satisfied	48	52
	.fairly satisfied	43	41
	.fairly dissatisfied	5	4
	.very dissatisfied	2	1
	c) the proximity of your job (or that of your spouse)		
	.no answer	19	26
	.very satisfied	36	42
	.fairly satisfied	34	27
	.fairly dissatisfied	8	4
	.very dissatisfied	3	1

APPENDIX XII - 2

QUESTION NO.		General Population	Plaintiffs
	d) the proximity of schools		
	.did not answer	20	20
	.very satisfied	32	27
	.fairly satisfied	35	35
	.fairly dissatisfied	10	12
	.very dissatisfied	3	6
	e) the proximity of stores		
	.did not answer	1	2
	.very satisfied	33	21
	.fairly satisfied	43	53
	.fairly dissatisfied	18	17
	.very dissatisfied	5	7
	f) are public means of transport available to you?		
	.did not answer	9	8
	.very satisfied	21	14
	.fairly satisfied	38	42
	.fairly dissatisfied	18	17
	.very dissatisfied	14	19
	g) are there amusement facilities in or near your neighborhood?		
	.did not answer	8	11
	.very satisfied	M8	11
	.fairly satisfied	42	36
	.fairly dissatisfied	26	27
	.very dissatisfied	16	15
	h) the cost of living?		
	.did not answer	1	2
	.very satisfied	0	2
	.fairly satisfied	20	28
	.fairly dissatisfied	52	54
	.very dissatisfied	27	14
	i) how quiet your neighborhood is		
	.did not answer	1	2
	.very satisfied	37	48
	.fairly satisfied	43	37
	.fairly dissatisfied	13	9
	.very dissatisfied	6	4

APPENDIX XII - 3

QUESTION NO.		General Population	Plaintiffs
3	-On the whole, do you think the environment you live in is noisy very noisy, fairly noisy, not very noisy or not noisy?		
	.did not answer	0	1
	.very noisy	14	7
	.fairly noisy	25	15
	.not very noisy	39	46
	.not noisy at all	22	31
4	-Do the noises you hear annoy you considerably, moderately, little or not at all?		
	.did not answer	0	0
	.considerably	11	9
	.moderately	20	15
	.little	33	39
	.not at all	36	37
5	-It is often said that noise is one of the plagues of modern life. How do you personally adapt to this?		
	.did not answer	1	2
	.perfectly well	6	11
	.fairly well	43	36
	.not very well	33	24
	.very poorly	17	27
6	-On the whole is noise around you:		
	.did not answer	0	0
	.unbearable	19	17
	.fairly unpleasant	52	51
	.indifferent	28	31
	.rather pleasant	1	1
7	-When you hear noise, how do you feel?		
	.did not answer	0	1
	.more nervous? much more nervous	29	25
	.a little more nervous	42	40
	.not more nervous than usual	29	34

QUESTION NO.		General Population	Plaintiffs
8	-What kind of noise awakens you?		
	.no answer	0	1
	.the slightest noise	23	24
	.a weak noise	20	24
	.a fairly strong noise	39	37
	.a very strong noise	18	14
9	-Does noise generally tire you?		
	.no answer	1	1
	.a lot	23	21
	.moderately	32	31
	.a little	28	28
	.not at all	16	19
10	-The fact that you live in a noisy environment, does this affect your health?		
	.no answer	0	0
	.deep influence	21	23
	.some influence	44	43
	.not very much influence	21	20
	.no influence at all	14	14
11	-Do the noises you hear in this environment annoy you considerably? moderately? Little? Not at all? Specifically:		
	a) do they prevent you from going to sleep?	1	0
	.considerably	8	4
	.moderately	11	7
	.little	18	17
	.not at all	62	72
	b) do they bother you during your sleep?		
	.no answer	0	0
	.considerably	6	4
	.moderately	12	9
	.little	16	12
	.not at all	66	75

QUESTION NO.		General Population	Plaintiffs
11	c) do they bother your conversations?		
	.no answer	0	0
	.considerably	5	2
	.moderately	13	12
	.little.	19	16
	.not at all	63	69
	d) do they keep you from concentrating? (reading, writing, thinking, etc.)		
	.no answer	0	0
	.considerably	7	4
	.moderately	14	13
	.little.	16	17
	.not at all	63	66
	e) do they bother your work or daily activities?		
	.no answer	1	3
	.considerably	4	2
	.moderately	9	8
	.little	15	17
	.not at all	71	70
	f) do they disturb you when you are listening to the radio or TV?		
	.no answer	0	3
	.considerably	9	5
	.moderately	17	13
	.little	17	15
	.not at all	57	64
	g) do they vibrate your house?		
	.no answer	1	0
	.considerably	22	47
	.moderately	25	26
	.little.	16	12
	.not at all	36	15
	h) do they excite your children (if you have any)?		
	.no answer	30	37
	.considerably	4	5

QUESTION NO.		General Population	Plaintiffs
11	h)		
	.moderately	9	6
	.little	12	10
	.not at all	45	42
	i) do they irritate you?		
	.no answer	0	2
	.considerably	13	20
	.moderately	25	27
	.little	23	18
	.not at all	39	33
	j) do they startle you?		
	.no answer	0	0
	.considerably	19	29
	.moderately	22	25
	.little	18	18
	.not at all	41	28
	k) do they frighten you?		
	.no answer	1	1
	.considerably	5	6
	.moderately	11	13
	.little	13	13
	.not at all	70	67
12	-More specifically, what kinds of noises do you hear around here?		
	."boom" (sound barrier, etc.)	*	
	.listed the boom spontaneously	36	70
	.did not list the boom	44	14
13	-What type of aircraft noises do you hear here?	*	
	.mentioned the boom or sound barrier	15	15
	.other answers	58	15

*percentages calculated for the total population

QUESTION NO.		General Population	Plaintiffs
14	-Do you ever hear aircraft noises that sound like explosions, thunder, noises made by going through "sound barrier" and which is called the "boom"?		
	.yes	35	15
	.no, never	23	0
15	(see next page)		
16	-How often do you think you hear the boom?		
	.no answer	1	1
	.less than once a month	26	10
	.1 to 3 times per month	32	25
	.1 to 2 times per week	20	26
	.3 to 6 times per week	11	19
	.on the average 1 time per day .	5	8
	.2 to 3 times per day	4	10
	.4 to 5 times per day	1	8
	.6 to 10 times per day	0	0
	.more than 10 times per day . .	0	0
17	-Are the booms you hear usually:		
	.no answer	0	1
	.very weak	1	0
	.fairly weak	9	2
	.fairly strong	48	30
	.very strong	35	55
	.deafening	7	12
18	-Would you say you are personally annoyed considerably, moderately little, very little or not at all by the boom?		
	.no answer	1	0
	.considerably	18	39
	.moderately	34	35
	.little	25	15
	.very little	11	7
	.not at all	11	4

APPENDIX XII - 7

QUESTION NO.		General Population	Plaintiffs	General Population	Plaintiffs	General Population	Plaintiffs
15	FOR ALL PEOPLE WHO HEAR THE BOOM	1	1	2	2	3	3
	-In your opinion, which are the most pressing problems to be solved below: List the three most pressing problems by order of priority.						
	.road accidents	33	28	28	23	15	17
	.sea and river pollution	5	6	8	11	9	8
	.air pollution	8	6	14	13	17	12
	.cluttering nature with waste products	4	2	7	5	10	7
	.booms produced by supersonic aircraft	7	24	10	20	11	15
	.noise	3	2	6	4	9	6
	.taking away parks	1	1	4	1	6	7
	.invasion of countryside and sea coasts by secondary residences	0	1	1	0	2	1
	.publicity invasion	1	0	1	0	3	3
	.cancer	38	20	21	23	18	24

QUESTION NO.		General Population	Plaintiffs
19	-Does the boom annoy you more, as much or less than other aircraft noises?		
	.no answer	1	2
	.more	69	84
	.as much	22	10
	.less	8	4
20	-Do the booms you hear in this area annoy you considerably, moderately, little or not at all? Specifically:		
	a) do they keep you from going to sleep?		
	.no answer	2	0
	.considerably	2	4
	.moderately	3	2
	.little.	6	10
	.not at all	87	84
	b) do they disturb you while you are sleeping?		
	.no answer	1	0
	.considerably	2	3
	.moderately	3	4
	.little.	4	4
	.not at all	90	89
	c) do they disturb your conversations?		
	.no answer	1	0
	.considerably	3	6
	.moderately	11	13
	.little.	16	20
	.not at all	69	61
	d) do they disturb your concentration (reading, writing, thinking, etc.)?		
	.no answer	0	2
	.considerably	4	6
	.moderately	11	11
	.little	15	20

QUESTION NO.		General Population	Plaintiffs
20	d)		
	.not at all	70	61
	e) do they disturb your work or daily activities?		
	.no answer	2	4
	.considerably	3	5
	.moderately	9	13
	.little	14	17
	.not at all	72	61
	f) do they disturb you when you are listening to the radio, TV?		
	.no answer	2	4
	.considerably	4	4
	.moderately	10	7
	.little	16	16
	.not at all	68	69
	g) do they vibrate your house?		
	.no answer	1	1
	.considerably	38	74
	.moderately	34	20
	.little	13	2
	.not at all	14	3
	h) do they excite your children (if you have any)?		
	.no answer	31	38
	.considerably	5	8
	.moderately	8	7
	.little	10	9
	.not at all	46	38
	i) do they irritate you?		
	.no answer	1	3
	.considerably	16	29
	.moderately	25	29
	.little.	20	18
	.not at all	38	21

QUESTION NO.		General Population	Plaintiffs
20	j) do they startle you?		
	.no answer	0	1
	.considerably	38	43
	.moderately	31	33
	.little	14	13
	.not at all	17	10
	k) do they frighten you?		
	.no answer	1	1
	.considerably	11	14
	.moderately	15	17
	.little	17	14
	.not at all	56	54
21	-To your knowledge, do booms cause damage?		
	.I do not know	3	2
	.very frequently	4	23
	.fairly often	14	39
	.sometimes	39	35
	.practically never	40	1
22	-To your knowledge, what kind of damage is it? (do not guess)		
	.no answer	45	3
	.affect on health of humans	9	6
	.affect on health of animals	11	13
	.collapsed homes	5	6
	.damage to roofs, walls, etc.	18	52
	.broken glass, windows, etc.	11	19
	.other damage in the home.	1	1
23	-Do you think the number of booms you hear for the past 2 years in this area have:		
	.considerably increased	7	19
	.moderately increased	21	26
	.stayed the same	45	34
	.declined	17	18
	.declined considerably	7	2
	.I do not know	3	1

QUESTION NO.		General Population	Plaintiffs
24	-Would you say that compared to two years ago:		
	.the boom does not annoy you more than before	13	35
	.it annoys you neither more nor less	71	54
	.it annoys you less	15	11
	.I do not know	1	0
25	-Do you think the boom would be bearable if you heard it:		
	.twenty times per day	3	5
	.10 to 15 times per day	1	3
	.6 to 10 times per day	5	6
	.2 to 3 times per day	37	28
	.one boom per day	34	27
	.I do not know	20	31
26	-If booms were ever produced at night would you find this:		
	.I do not know	1	0
	.absolutely unacceptable	65	75
	.difficult to accept	23	17
27	-Have you ever:		
	a) read articles about the boom and its effects in newspapers or magazines?		
	.no answer	0	0
	.yes	56	61
	.no	44	39
	b) read articles about the boom and its effects in specialized technical magazines?		
	.no answer	1	0
	.yes	4	15
	.no	91	85
	c) heard about the boom and its effects on the radio or TV?		
	.no answer	0	2

QUESTION NO.		General Population	Plaintiffs
27	c)		
	.yes	58	44
	.no	42	54
	d) heard about the boom and its effects from parents, friends, co-workers, neighbors, etc.		
	.no answer	0	0
	.yes	63	91
	.no	37	9
28	-To your knowledge are there regulations restricting booms?		
	.no answer	42	38
	.yes	40	44
	.no	18	18
29	-Do you think that the booms you hear in this area are produced		
	.I do not know	33	23
	.only by military aircraft	44	63
	.only by civilian aircraft	3	1
	.or by both	20	13
30	-To your knowledge are the booms heard in other parts of France produced:		
	.only by military aircraft	24	27
	.only by civilian aircraft	1	1
	.by both	32	31
	.I do not know	43	41
31	-For each category of people below would you tell me if you think they can do anything to restrict booms?		
32	-Do you think they do everything they can to restrict booms, or do you think they do not do everything they could do?		

QUESTION NO.		General Population	Plaintiffs
Q. 31	a) airplane manufacturers		
	.have the possibility	49	39
	.do not have the possibility . .	21	26
	.I do not know	30	35
	b) pilots		
	.have the possibility	40	48
	.do not have the possibility . .	30	29
	.I do not know	30	23
	c) Air Force		
	.have the possibility	59	66
	.do not have the possibility . .	11	13
	.I do not know	0	1
	d) civilian airlines		
	.have the possibility	43	42
	.do not have the possibility . .	16	17
	.I do not know	41	41
	e) civilian airport controllers		
	.have the possibility	28	31
	.do not have the possibility . .	24	24
	.I do not know	48	45
	f) public officials		
	.have the possibility	60	64
	.do not have the possibility . .	11	14
	.I do not know	29	22
	g) building contractors and architects		
	.have the possibility	28	25
	.do not have the possibility . .	34	40
	.I do not know	38	35
Q. 32	a) airplane manufacturers		
	.do everything they can	20	12
	.do not do everything they can .	27	27
	.I do not know.	2	61

QUESTION NO.		General Population	Plaintiffs
Q. 32	b) pilots		
	.do everything they can	15	8
	.do not do everything they can .	25	42
	.I do not know	0	50
	c) Air Force		
	.do everything they can	14	12
	.do not do everything they can .	36	47
	.I do not know	9	41
33	d)-Have you heard about the Concorde?		
	.I do not know	1	0
	.yes	94	93
	.no	5	7
34	-Do you think the Concorde can produce a boom?		
	.I do not know	22	21
	.yes	64	73
	.no	14	6
35	-At present, there are traditional commercial aircraft exceeding the speed of 1,000 km per hour and new supersonic aircraft that can exceed 2,000 km per hr. Compared to the traditional commercial aircraft, do the new supersonic aircraft seem:		
	a).useful	61	58
	.or not useful	29	32
	.I do not know	10	10
	b).more expensive	60	52
	.less expensive for clients . .	19	24
	.I do not know	21	24
	c).advantageous only for certain categories of passengers . . .	58	57
	.or equally advantageous for anyone who takes the airplane	29	27
	.I do not know	13	16

QUESTION NO.		General Population	Plaintiffs
35	d).rather dangerous	49	43
	.less dangerous	23	24
	.I do not know	28	33
	e).more comfortable	67	56
	.or not more comfortable . .	12	15
	.I do not know	21	29
	f).indispensable	40	40
	.not more indispensable . . .	47	46
	.I do not know	13	14
36 A	-In your opinion, should supersonic - commercial or military - aircraft be authorized to produce booms in the following areas:		
	A-Commercial Aircraft		
	a) over the entire national territory		
	.yes	12	7
	.no	64	87
	.I do not know	4	6
	b) above large cities		
	.yes	3	1
	.no	96	94
	.I do not know	1	4
	c) near airports		
	.yes	35	26
	.no	61	67
	.I do not know	4	4
	d) over regions of low population density		
	.yes	51	44
	.no	47	51
	.I do not know	2	5
	e) in the mountains during winter		
	.yes	22	18
	.no	74	74
	.I do not know	4	8
	f) above the high sea		
	.yes	89	88

QUESTION NO.		General Population	Plaintiffs
36 A	f)		
	.no	8	7
	.I do not know	3	5
	g) over the coast		
	.yes	27	19
	.no	68	73
	.I do not know	4	8
	h) at low altitudes		
	.yes	3	2
	.no	95	93
	.I do not know	2	5
	i) at high altitudes		
	.yes	74	70
	.no	22	23
	.I do not know	4	7
B-Military Aircraft			
	a) over the entire national territory		
	.yes	12	8
	.no	81	82
	.I do not know	6	10
	b) over large cities		
	.I do not know	4	7
	.yes	2	1
	.no	94	92
	c) near airports		
	.I do not know	6	10
	.yes	33	24
	.no	61	66
	d) over regions of low population density		
	.I do not know	5	9
	.yes	48	40
	.no	47	51
	e) in the mountains during winter		
	.I do not know	6	11
	.yes	85	16
	.no	9	73
	f) over the high sea		
	.I do not know	6	8

QUESTION NO.		General Population	Plaintiffs
36 B	f)		
	.yes	85	84
	.no	9	8
	g) over the coast line		
	.I do not know	6	10
	.yes	26	17
	.no	68	73
	h) at low altitudes		
	.I do not know	5	7
	.yes	3	1
	.no	92	92
	i) at high altitudes		
	.I do not know	6	10
	.yes	71	65
	.no	23	25
37	-Have you ever officially protested against the annoyance or sued for material damages caused by the boom?		
	.yes, only for annoyance.	1	0
	.yes, only for material damages	0	90
	.yes, both for annoyance and material damages	0	10
	.no	99	0
45 *	-Do you know of people in your area who have sued because of the boom?		
	.no answer	1	
	.yes	11	
	.no	88	
46	-Did these people sue:		
	.only for annoyance caused by the boom	2	
	.only for material damages caused	7	
	.for both	2	
	.no answer	89	

*Questions 45 to 49 relate only to people who have not sued for material damages.

QUESTION NO.		General Population

47 A -Have you personally taken any of the actions indicated on this questionnaire to protest or sue against the boom, if so, which ones?

47 B -Are there any actions indicated on this questionnaire that you would have not taken, but that you would like to take?

Q. 47 A 1) write or telephone a public official?

.no answer	2
.yes	0
.no	98

2) personally see a public official

.no answer	2
.yes	0
.no	98

3) sign or circulate a petition

.no answer	2
.yes	1
.no	97

4) attend a public meeting

.no answer	2
.yes	1
.no	97

5) initiate another action (what?)

.no answer	10
.yes	0
.no	90

Q. 47 B 1) write or telephone a public official

.no answer	3
.yes	8
.no	89

QUESTION NO.		General Population	Plaintiffs
47 B	2) go to see a public official		
	.no answer	2	
	.yes	6	
	.no	92	
	3) sign or circulate a petition		
	.no answer	2	
	.yes	15	
	.no	83	
	4) attend a public meeting		
	.no answer	3	
	.yes	6	
	.no	91	
	5) initiate another action (what?)		
	.no answer	11	
	.yes	1	
	.no	88	
48	-On the whole, do you believe in the the effectiveness of these different means of protesting against the boom?		
	.no answer	2	
	.considerably	8	
	.moderately	28	
	.little	38	
	.not at all	24	
49	-Would you sign a petition against the boom?		
	.no answer	1	
	.yes, certainly	45	
	.yes, perhaps	27	
	.no, probably not	14	
	.no, certainly not	13	
A	-How long have you been living in this region?		
	.no answer	0	8
	.at least one year	4	2

QUESTION NO.		General Population	Plaintiffs
A	.2 or 3 years	6	3
	.4 to 5 years	5	4
	.6 to 10 years	9	12
	.more than 10 years	76	71
B	-Are there children in your home younger less than 15 years old, if so, how many?		
	.no answer	52	69
	.1	18	16
	.2	16	9
	.3	8	4
	.4	3	1
	.5 and older	3	1
C	-How many people are there in your home, including yourself?		
	.1	9	18
	.2	25	27
	.3	18	18
	.4	19	15
	.5	15	10
	.6	7	7
	.7	3	2
	.8	2	2
	.9 and older	2	1
	.no answer	0	0
D	-We would like to analyze the results of this survey on the basis of family income of the people we have interviewed. Here is a scale of monthly incomes (SHOW THE CARD). Please indicate your total monthly income level, including salaries, retirement funds, income.		
	.less than 250 F	3	5
	.250 to 499 F	6	8
	.500 to 799 F	12	8
	.800 to 1249 F	23	18
	.1250 to 1749 F	19	12
	.1750 to 2499 F	15	13
	.2500 to 3999 F	8	13
	.4000 or more	3	7
	.no answer	11	16

QUESTION NO.		General Population	Plaintiffs
E	-Do you own your home?		
	.no answer	2	2
	.owner	46	82
	.renter	52	16
F	At what level were you last in school?		
	.primary	61	47
	.middle school	7	12
	.secondary	12	19
	.technical, commercial	13	7
	.university	5	12
	.did not attend school	2	3
G	-Profession of the individual interviewed:		
	.salaried farmer	1	0
	.independent farmer	12	26
	.industrial worker	0	2
	.craftsman	2	3
	.liberal, literary, scientific, teaching, medical and social professions	4	4
	.engineers, technicians	1	1
	.administrators	3	5
	.big businessmen	0	2
	.small businessmen	3	14
	.army, police, customs officer	1	0
	.artists, clergy	0	2
	.foremen, specialized, qualified workers, miners, fishermen	11	2
	.apprentice	0	0
	.operators	1	0
	.personnel workers	3	1
	.office workers	4	1
	.business employees, travel agents	1	1
	.non active people	52	34
	.no answer	1	2
H	-Are you head of household?		
	.salaried farmers	1	0
	.independent farmers	16	25
	.industrial workers	1	2
	.craftsmen	4	4

QUESTION NO.		General Population	Plaintiffs
H	.liberal literary, scientific, teaching, medical professions	4	4
	.engineers, technicians	3	2
	.administrators	6	6
	.big businessmen	0	2
	.small businessmen	4	12
	.army, police, customs, officers	2	1
	.artists, clergy	0	2
	.foremen, qualified workers, miners, fishermen	24	3
	.apprentice	0	0
	.operators	2	0
	.personnel	2	1
	.office workers	5	1
	.business employees, travel agents	1	2
	.non active people	24	31
	.no answer	1	2
J	-Sex		
	.male	46	72
	.female	54	28
K	-Age		
	.20 to 24 years old	9	1
	.25 to 29	8	2
	.30 to 34	10	4
	.35 to 39	10	8
	.40 to 44	10	8
	.45 to 49	11	12
	.50 to 54	7	8
	.55 to 59	8	12
	.60 to 64	9	13
	.65 years and older	18	32
L	-If there were elections now for representatives to the legislature, what party would you vote for?		
	.middle-of-the road	5	6
	.communist party	7	3
	.radical party	3	4
	.U.D.R.	17	23
	.socialist party	13	9
	.independent republican	7	15
	.P.S.U.	2	0
	.other	9	6
	.no answer	37	34

QUESTION NO.		General Population	Plaintiffs
M	-Type of community:		
	.rural	29	56
	.city or urban center of:		
	.less than 10,000 inhabitants	12	15
	.10,000 to 20,000 inhabitants	9	6
	.20,000 to 100,000 inhabitants	27	11
	.100,000 to 200,000 inhabitants	13	11
	.more than 200,000 inhabitants	9	1
N	-Is the neighborhood you live in:		
	.a business area	23	22
	.industrial	11	5
	.residential	39	25
	.rural	24	46
	.no answer	3	2

APPENDIX XIII

FREQUENCIES OF ANSWERS TO QUESTIONS FOR PLAINTIFFS (N = 283)

QUESTION NO.		%
37	-Have you ever filed a complaint for the annoyance or material damages caused by the boom?	
	.yes, only for the annoyance caused by the boom	0
	.yes, only for damages	90
	.yes, for annoyance and damages	10
	.no	0
38	-What kind of damage? (BE PRECISE, DO NOT SUGGEST)	
	.no answer or wrong answers	2
	.broken glass, windows	22
	.broken, damaged window	10
	.broken dishes, glasses	3
	.cracked, damaged ceiling	11
	.damaged, collapsed roof	11
	.collapsed wall, home	12
	.cracks in home, on walls, etc.	19
	.fallen objects, lap lamps, wall elements .	4
	.other answers, broken tile, etc..	6

QUESTION NO.		%
39	-(INDICATE THE TYPE OF DAMAGE SHOWN ON THE CONTRACT SHEET)	
	.no answer or wrong answer	15
	.broken windows, glass	19
	.broken window panes	10
	.broken plates, glasses	1
	.cracked ceiling	10
	.damaged roof, collapsed roof	10
	.collapsed wall, home	8
	.cracks in home on a wall, etc.	19
	.fallen objects, lamps, wall elements	4
	.other answers, broken tile, etc.	4
40	-Where did you file your complaint?	
	.no answer	2
	.town hall	15
	.prefect	2
	.gendarme (national guard)	52
	.police station	2
	.national guard (air)	2
	.air base	8
	.air force	4
	.insurance agent	11
	.other answers, representative, etc.	2
41	-Did the formalities seem complicated, fairly complicated, rather simple, or very simple?	
	.no answer	1
	.very complicated	12
	.fairly complicated	20
	.rather simple	49
	.very simple	18
42	-Did you receive the compensations you asked for?	
	.no answer	1
	.yes, in full	14
	.yes, only partially	15
	.no, the suit was rejected	31
	.no, the suit is still in progress	39

QUESTION NO.		%
43	-Do you intend to pursue your action in court?	
	.I do not know	51
	.yes, certainly	3
	.yes, perhaps	5
	.no, probably not	8
	.no, certainly not	33
44	-If more damage is caused by the boom, will you file another complaint?	
	.I do not know	1
	.yes, certainly	91
	.yes, probably	3
	.no, probably not	3
	.no, certainly not	2